SITE OPERATIONS PLAN
PHASE III REMOVAL ACTION

FORMER P.R. MALLORY PLANT SITE
CRAWFORDSVILLE, INDIANA

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CRAWFORDSVILLE, INDIANA

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CONESTOGA-ROVERS & ASSOCIATES

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1.0 INTRODUCTION

1.1 GENERAL

The activities to be addressed by the Site Operations Plan which will be implemented during the Phase III Removal Action at the former P.R. Mallory Plant Site have been outlined within the "Phase III Removal Action Plan" dated September 1988. The Site Operations Plan presented herein provides the basis for construction activities and field quality control procedures. In addition, the Site Operations Plan details the procedures to be followed to ensure that cleanup criteria are met and that the requirements of the associated quality control/quality assurance program are satisfied. The existing Quality Assurance Project Plan (QAPP), Health and Safety Plan (HASP), including approved amendments to each plan have been consolidated within this document to ensure consistency with previous activities conducted at the Site.

Maintenance of the Site Operations Plan will be the responsibility of Battery Properties Inc.'s designated representatives. Battery Properties Inc., through their field representatives, will evaluate the need for and approve any variations from the Site Operations Plan necessitated by field conditions. The United States Environmental Protection Agency (USEPA) and the Indiana Department of Environmental

Management (IDEM) will be notified when possible prior to implementing any changes to the Site Operations Plan. All changes will be documented to ensure the modification and cause are identified.

2.0 PROJECT DESCRIPTION

2.1 SITE DESCRIPTION AND HISTORY

The former P.R. Mallory plant site (Site) is located approximately three miles east of Crawfordsville, Indiana in Montgomery County as shown on Figure 1.1. Situated on lands currently owned by Terra Products Inc., the Site is bordered by State Road No. 32 to the south and Little Sugar Creek to the north. The concrete floor slab, pumphouse and incinerator, which are all that remain of the former operation, are located southwest of the ravine which drains the area to Little Sugar Creek.

P.R. Mallory manufactured dielectric capacitors at the Site from 1957 to 1969. During this period, a variety of dielectric fluids including oils containing polychlorinated biphenyls (PCBs) were used in the manufacturing process. Operations were temporarily suspended in 1968 after a fire destroyed the impregnation room in the northeast section of the plant. Operations were resumed until 1969 when a second fire destroyed the entire plant.

In 1986, subsequent to a preliminary site investigation and evaluation, the USEPA issued an amended Administrative Order, dated August 20, 1986, which required

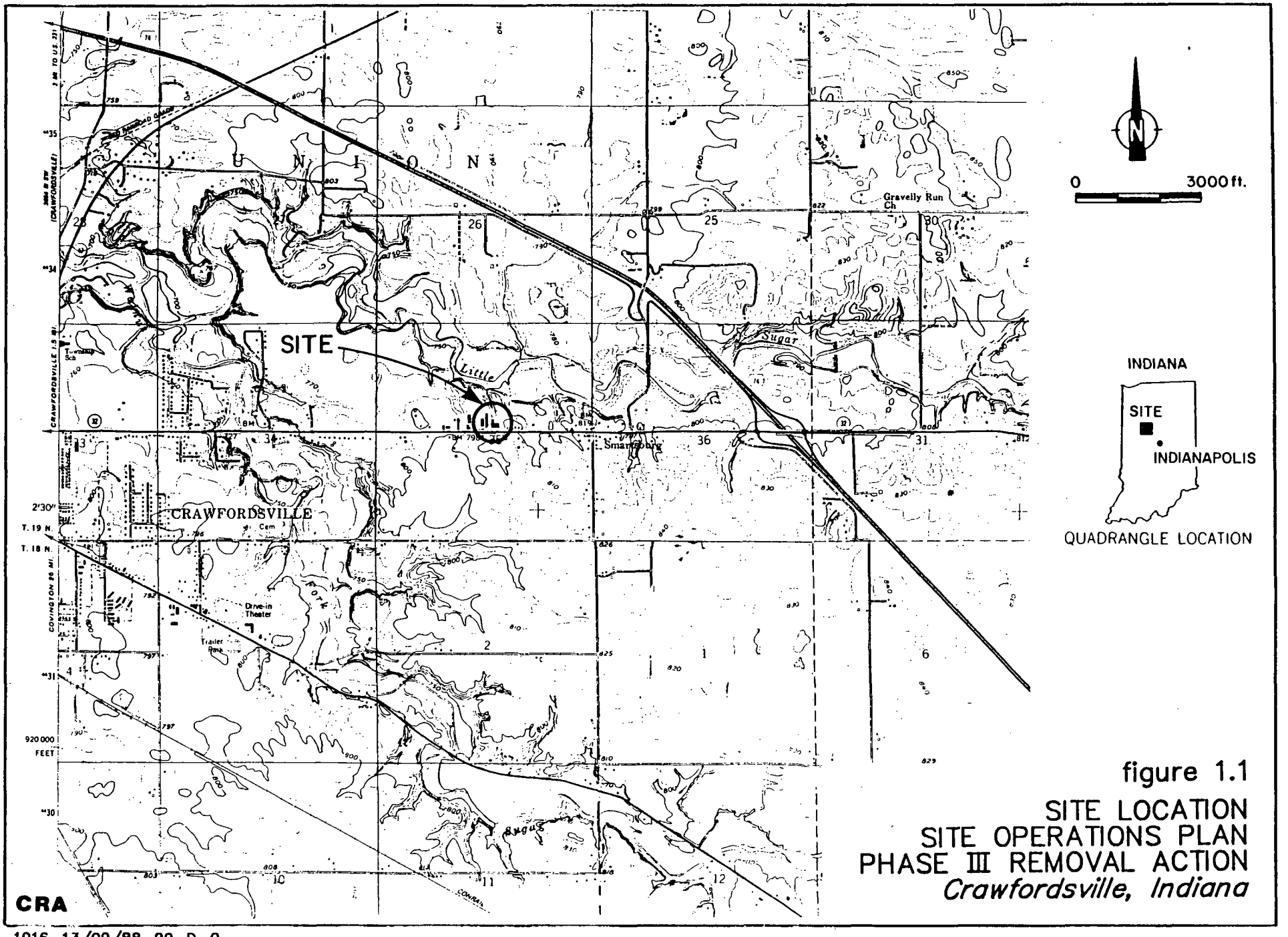

figure 1.1
SITE LOCATION
SITE OPERATIONS PLAN
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1916-13/09/88-29-D-0

the respondents (Duracell International Inc., Terra Products Inc., and Superior Moving and Storage Co.) to undertake emergency removal and remedial activities at the Site.

Subsequent to issuance of the USEPA Order, the State of Indiana filed a separate Complaint and proposed Order under authority of IC 13-7-11 of the Indiana Environmental Act against the respondents named in the USEPA Order, also requiring removal and remedial activities at the Site.

Work completed to date has substantially addressed the immediate removal response and site investigation requirements of the USEPA Administrative Order and IDEM Complaint and proposed Order. Activities have been implemented in phases, consisting of several remedial and investigative programs. Briefly, the work performed under each program is summarized as follows:

i) Initial Site Screening Sampling Program -

Soil samples were collected in the apparent capacitor disposal areas above and in the ravine, and adjacent to the plant slab and incinerator. Sample analyses confirmed the presence of elevated concentrations of PCB in these areas and indicated that secondary

contaminants of concern were chlorinated dibenzo-p-dioxins (CDDs) and chlorinated dibenzofurans (CDFs).

ii) Phase I Remedial Construction -

Measures were implemented to prevent public access to contaminated areas and to minimize the potential for off-Site releases of contaminants. Specific activities included: erection of a security fence encompassing suspected areas of contamination, excavation of the apparent capacitor disposal areas with soil and capacitors secured in an on-Site interim storage cell, removal and decontamination of miscellaneous scrap and debris, securement of excavated areas with high density polyethylene (HDPE) overliners, installation of a sediment trap and oil absorbent boom in the ravine, and installation of seven groundwater observation wells.

iii) Phase I Sampling and Analysis Program -

The Phase I sampling and analysis program was conducted concurrently with the Phase I remedial construction. Collected samples of soil, sediment, concrete, surface water, groundwater and ambient air were analyzed for selected analytical parameters. All sample matrices were analyzed for PCB. Additional

parameters consisted of: CDD and CDF for soil, sediment, and surface water samples; lead and cadmium for selected soil and sediment samples; volatile organic compounds (VOCs) and base/neutral acid extractables (BNAs) for selected soil samples; pH, conductivity, and dissolved oxygen for surface water samples; and general groundwater parameters, VOCs, CDDs, and metals for groundwater samples. The reported analytical results indicated that soils were primarily PCB affected with limited CDD/CDF contamination, ravine surface waters contained detectable levels of PCB and that potential releases to groundwater and ambient air were not of concern.

iv) Phase I Supplemental Sampling and Analysis Program - Upon completion of the Phase I sampling program and a review of the data generated, the Phase I supplemental program was implemented to address additional data requirements and to verify the results of the preceding program. Supplemental sampling was conducted to aid in delineating the areal and vertical extent of PCB affected soils, sediments, and surface water. In addition to analysis for PCB, supplemental analyses were also conducted for lead, cadmium, VOCs, and CDD/CDF on selected soil and sediment samples, and

pH and conductivity for surface water samples. An additional round of groundwater sampling was conducted as part of the supplemental program to confirm the results of the initial sampling round. Groundwater analytical parameters included PCB, CDD/CDF, VOCs and general geochemical parameters. The areal extent of the groundwater investigation was expanded in this program by including sampling of Terra Products and Superior Moving's water supply wells. The results of the supplemental program aided in further delineation of affected areas and provided further verification of the groundwater results from Phase I.

v) Phase II Remedial Construction -

The excavation and on-Site securement of soil with elevated PCB concentrations from areas which were accessible to the public was completed during this phase of work. An area adjacent to Superior's facilities and the upstream portion of the ravine were remediated. Excavated soil was placed into a second constructed interim storage cell and secured in a soil stockpile. Debris collected from the ravine was secured in a constructed containment cell and the existing pumphouse well system was dismantled. Excavated areas were secured with synthetic liners and/or backfill following the

collection of soil samples for confirmatory analyses. Additional oil absorbent booms and sediment traps were installed in the ravine as part of the Phase II effort.

vi) Phase II Sampling and Analysis Program -

Soil samples were collected and analyzed as part of the program to further delineate the vertical and areal extent of residual PCBs in Site soils. Additional soil samples were collected to confirm previous findings for the levels of dioxins and furans in Site soils. The alignment of pipes ending in the ravine was delineated by exploratory excavations; pipe bedding materials were analyzed for PCBs. Confirmatory level samples were collected and analyzed for excavated surfaces, stockpiled soil and pump parts disassembled during construction. The primary findings of the program indicated PCB concentrations in soils typically decrease with increasing depth, low dioxin and furan concentrations identified in previous programs were comparable, and that pipe bedding materials for select pipes contained low to elevated concentrations of PCBs. Confirmatory analyses found low to elevated levels of PCBs at the base level of excavated surfaces and elevated concentrations in

stockpiled soil. Low levels of PCBs (typically less than 100 ug/100 cm^2) were identified on the surfaces of disassembled pump parts.

vii) Phase II Hydrogeologic Program -

This phase of the hydrogeologic program included the installation of two additional observation wells and a borehole for geologic characterization. Previously installed observation wells, the pumphouse well, Terra's and Superior's supply wells, and the newly installed wells were sampled as part of the Phase II program. The primary findings were that the sand lenses identified during previous investigations appear to be continuous towards the ravine but not continuous over the Site, a vertical downwards hydraulic gradient exists at the Site, and there is little, or any, groundwater contamination on or off the Site.

A more complete description and discussion of the work activities completed to date and the site characterization data are presented in the final reports pursuant to each of the above programs. Implementation of these programs has achieved the following objectives:

i) securement of the Site to prevent public access;

ii) on-Site securement of debris, capacitors and contaminated soils which potentially represented an imminent hazard to the environment;

iii) on-Site securement of materials from outside the Site fence containing elevated concentrations of PCB;

iv) delineation of the areal limits of residual contamination; and

v) delineation of the vertical limits of residual contamination over specific portions of the Site.

Based on an evaluation of the data collected to date, sufficient physical and chemical information are available to proceed with the final cleanup of residually contaminated soil, sediment and debris at the Site.

2.2 SCOPE OF WORK

The scope of work to be performed under the Phase III Removal Action includes those measures required to remove and dispose of residually contaminated soil, sediment and debris at the Site and restore the affected areas to

pre-cleanup conditions. The removal action is consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) 42 U.S.C. 9601 et. seq. as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) 40 CFR Part 300, and existing USEPA policy.

As presented in the Phase III Removal Action Plan, the scope of the Phase III program has been developed to meet several objectives, including:

i) compliance with applicable regulatory requirements and policies regarding the implementation of PCB Site cleanups;

ii) ensure the safety and health of the public and on-Site personnel and protection of the environment during and following implementation of the proposed work;

iii) provide an effective solution to the management of PCB materials at the Site; and

iv) minimize or eliminate the requirements if any, for post-cleanup environmental monitoring.

The work activities which will be implemented under Phase III will address the removal of previously excavated and in situ PCB affected soils, concrete, and other miscellaneous materials currently on Site. Currently proposed Phase III activities do not address the need for remediation of groundwater at the Site, if required, or of sediments in Little Sugar Creek, if necessary. Specific tasks associated with the Phase III Removal Plan include the following:

i) mobilization of construction facilities, materials, equipment, plant and personnel to perform the work;

ii) implementation of the Site health and safety plan;

iii) Site preparation activities including:

a) locating and maintaining all underground and above ground utilities,
b) supply and installation of temporary fencing and warning signs to delineate and separate work areas,
c) clearing trees and brush, and collecting debris, and
d) construction of access routes including ravine access;

iv) demolition of the pumphouse, incinerator, existing decontamination pad, two interim storage cells and contaminated portions of the existing plant slab;

v) excavation of in situ contaminated soil and other material and loading of the excavated material into haul vehicles/containers for off-Site disposal;

vi) backfilling of the excavations with clean imported fill;

vii) removal of existing materials including oil absorbent booms, sediment traps, liners and other debris;

viii) handling, transportation and off-Site disposal of contaminated and noncontaminated waste materials including:

a) excavated contaminated soil,
b) contaminated soil stored in interim storage cell No. 2,
c) mixed contaminated soil and capacitor components stored in interim storage cell No. 1,
d) drummed wastes consisting of refuse, lean solvent wastewaters, PCB articles and PCB capacitors,
e) demolition debris,
f) trees, brush and debris, and
g) miscellaneous items and materials;

ix) restoration of the Site including revegetation, and erosion control; and

x) project closeout activities including decontamination and demobilization.

Detailed procedures which will be followed to implement the above tasks are presented in the following sections of the Site Operations Plan.

2.3 PROJECT ORGANIZATION

2.3.1 Project Engineer

Battery Properties Inc. has retained the firm of Conestoga-Rovers and Associates (CRA) to provide overall project coordination services and field oversight services during the implementation of the removal program. CRA will develop the guidelines for all quality control and operational plans, health and safety plans, and oversee construction activities and analytical work associated with this project. CRA will designate a Project Coordinator to act as Battery Properties Inc.'s representative relative to all on-Site activities.

CRA will provide a Field Engineer (Engineer) and additional field support personnel as required to oversee the removal activities. The Engineer will report directly to CRA's Project Coordinator and will oversee on-Site activities on a daily basis.

2.3.2 Contract Laboratory

Battery Properties Inc. will retain one or more contract laboratories to provide analytical support services associated with the removal program. The contract laboratories will perform analysis of all soil samples required under the confirmatory sampling and analysis plan and analysis of all liquid samples for which characterization is required for disposal purposes. The analysis of air samples under the HASP will conducted by a laboratory to be engaged by the Contractor. The contract laboratory which will conduct the CLP confirmatory analyses for soil samples will be approved by the USEPA contract laboratory program. Samples to be analyzed for confirmatory screening purposes may be performed by an on-Site laboratory if deemed appropriate by Battery Properties Inc.

2.3.3 Cleanup Contractor

A cleanup contractor (Contractor) will be retained to perform the removal work in accordance with Contract Specifications to be developed and issued for bid by Battery Properties Inc. The Contract Specifications will define the Scope of Work to be conducted by the Contractor and will be consistent with the Site Operations Plan.

The Contractor will be selected by Battery Properties Inc. using their in-house procurement procedures, The Contractor will be selected on the basis of previous experience on similar projects, demonstrated qualifications of project staff and cost-effectiveness.

The Contractor will be responsible for completing the work on schedule and in accordance with the Contract Specifications. The Contractor will coordinate the field activities of his personnel and those of his subcontractors.

3.0 MOBILIZATION AND SITE PREPARATION

3.1 GENERAL

Mobilization and Site preparation activities include all activities required to acquire, develop and transport plant, equipment, personnel and supplies to the Site and prepare the Site for the commencement of removal operations.

The extent of the mobilization and Site preparation activities are indicated on Plan 2.

3.2 PERSONNEL SUPPORT AND HYGIENE FACILITIES

At the commencement of Site work the Contractor will initially mobilize all personnel support and hygiene facilities as specified in the Contract Specifications. Facilities to be established on Site will include:

i) personnel hygiene facility/emergency medical facility,

ii) Contractor's office trailer,

iii) Engineer's office trailer for the use of non-Contractor personnel, and

iv) separate tankage for potable water and wastewater.

The above facilities will be located on Site in the approximate locations indicated on Plan 2 and as detailed on the Contract Drawings. The facility locations will be confirmed during mobilization.

3.2.1 Personnel Hygiene/Decontamination Facility

The personnel hygiene/decontamination facility to be provided will comply with the requirements of 29 CFR 1910.141. The facility will contain, as a minimum, the following:

i) shower facilities;

ii) locker room;

iii) laundry area;

iv) toilet facilities;

v) a break room where personnel can eat, drink or smoke; and

vi) a room where all personnel safety equipment and protective clothing can be stored.

Wastewaters from the shower and laundry facilities will be conveyed to the wastewater treatment and storage facility.

Separate holding tanks will be provided for the sanitary waste from the toilet facilities. The wastes will be removed and discharged to a municipal sewerage system on a periodic basis as required and in accordance with governing regulations of authorities having jurisdiction.

3.2.2 Emergency First Aid Facility

An emergency first aid facility will be provided which complies with the requirements of 29 CFR 1910.141. This facility at the Contractors option may be housed within or adjacent to the Personnel Hygiene/ Decontamination Facility. The Emergency First Aid Facility will have available, as a minimum, the following equipment and supplies:

i) stretcher;

ii) one set of crutches;

iii) two fire extinguishers meeting the requirements of 29 CFR 1910.307;

iv) two self contained breathing apparatus units;

v) one counter and sink with running potable water connected to the sanitary holding tanks;

vi) blankets and towels as required;

vii) first aid kit containing medications appropriate for the initial treatment of burns, abrasions fractures, and ingestion or dermal contact with on-Site hazardous waste;

ix) two complete sets of enhanced USEPA Level B personnel protective equipment; and

x) a portable emergency eye wash and shower.

3.3 CONSTRUCTION UTILITIES

Construction utilities will be connected to the Site facilities from available utilities located along State Route 32. Utilities to be supplied to the Site will include electrical power and telephone. Application will be made to the appropriate utility authorities prior to constructing the connecting lines. Construction standards will be in accordance with the requirements of the utility authorities and all appropriate utility and electrical codes.

3.4 WEIGH SCALE

A weigh scale will be mobilized to Site and installed for the weighing of waste materials transported off-Site. The weigh scale will consist of a truck scale of sufficient capacity to weigh the loaded vehicles which the Contractor proposes to use for the off-Site transportation of manifested waste materials. The scale will be tested for calibration prior to initial use.

3.5 WASTEWATER TREATMENT

A wastewater treatment system will be used at the Site for the treatment of miscellaneous wastewater. Water to be treated on-Site, prior to disposal, includes ponded water from potentially contaminated excavation surfaces and storage/staging areas and water from the decontamination pad.

The treatment system will consist of a pre-treatment sand or bag filter followed by an activated carbon filter. Nominal treatment capacity will be set at 10 gpm. The treatment system and holding tanks will be placed in a lined and curbed containment area on the Site. Wastewater will be stored in a holding tank prior to treatment. Treatment waters will be discharged to a separate holding tank. Samples will be collected from the treated water holding tank for PCB analysis.

All treated waters will be transported to an appropriate off-Site disposal facility selected on the basis of the PCB analyses. Samples which show PCB levels to be less than 1 ppb will be transported to a publicly owned treatment work (POTW) or alternate treatment system. Treated waters with PCB concentrations above 50 ppm will be repassed through the treatment units until the concentration is below 50 ppm. Treated waters with PCB concentrations above 1 ppb

but less than 50 ppm will be transported to an off-Site wastewater treatment facility permitted to accept liquids containing PCBs. Alternately, treated water may be used for dust control in contaminated soil staging areas or during excavation of residually contaminated soil. Untreated or treated wastewaters with PCB concentrations above 50 ppm will be sent to an off-Site incinerator.

3.6 PREPARATION OF SUPPORT AREAS AND ACCESS ROUTES

Support areas to be prepared in advance of commencing excavation include the areas where office, decontamination, and storage trailers will be placed, the site access road running parallel with the west fence, the truck staging area, and the parking area. These areas to the north of the Site will be graded as required during mobilization and subsequently maintained thereafter.

Ravine access routes will be constructed as required for excavation and backfilling operations in the ravine. The construction of access routes will be permitted only on the west slopes of the ravine; construction on the east slopes will be prohibited.

Ravine access routes will not be permitted to be constructed on contaminated or potentially contaminated

soil. Where access routes cross zones of contamination, the contaminated soil will be excavated in advance of access route construction.

3.7 DECONTAMINATION FACILITIES

Decontamination of machinery will take place on decontamination pads and will consist of degreasing, if required, followed by high pressure, hot water cleaning supplemented by detergents or solvents as appropriate. Special attention will be paid to removal of material on and within the tracks and sprockets of crawler equipment, and the tires and axles of trucks and rubber tire mounted equipment. Measures will be taken to minimize the drift of mist and spray during decontamination. Such measures may include the use of wind screens.

The existing decontamination pad will be used for equipment decontamination prior to demolition. A temporary replacement decontamination pad will be constructed prior to demolition of the existing pad. The temporary pad will be constructed with an integral underliner of high density polyethylene (HDPE).

The decontamination wash units will be portable, high pressure units with self-contained water

storage tankage and pressurizing system. Each unit will be capable of heating wash waters to 180°F and providing a nozzle pressure of 150 psi.

All decontamination waters will be collected and transferred to the feed tank of the wastewater treatment and storage facility. Sediment collected in the decontamination pad sumps will periodically be collected and placed with contaminated soil for disposal.

4.0 MATERIALS HANDLING PLAN

4.1 GENERAL

Material handling operations which will be implemented during the Phase III program include clearing, excavation, materials segregation, demolition and backfilling. Residually contaminated materials including excavated soils, stockpiled soils, staged debris and concrete rubble will be loaded out and disposed off-Site as specified. The appropriate disposition of materials to be removed from Site and the disposition criteria which will apply are detailed in Section 6.

4.2 VEGETATIVE CLEARING

Vegetation including trees and brush will be removed from all active work areas and excavation areas prior to commencement of excavation. Trees and brush in excavation areas will be cut off 18 inches above grade. Vegetation cut from above the 18-inch mark is considered free of any residual contamination and will be disposed of in a sanitary landfill; vegetation below the 18-inch mark is considered contaminated and will be disposed of with the excavated residually contaminated soil.

Vegetation cleared from clean areas of the Site to provide access or to clear support areas will be cut at grade. This vegetation will either be disposed of off Site or stockpiled in a clean area of the Site for use by the property owner.

4.3 REMOVAL OF DEBRIS

Surficial debris located in the ravine will either be removed with the soil during excavation or removed and staged in advance of excavation.

Items of debris which are small and intermixed with the residually contaminated soil will be considered contaminated; this material will be excavated and loaded out with the contaminated soil. Large items of debris such as scrap metal which can be decontaminated will be removed in advance of commencing excavation. These items will be decontaminated on the decontamination pad or other lined surface and staged. Decontamination will consist of cleaning with a high-pressure water wash. Following decontamination, the items will be wipe sampled; the analytical results will be used to determine the appropriate disposition of these items.

Should the Engineer determine that insufficient quantities of debris are available to justify wipe sampling and analysis, the debris will be loaded out directly with residually contaminated materials without conducting sampling and analysis.

4.4 REMOVAL OF SYNTHETIC LINERS

Existing liners to be removed to provide access to staged material or areas to be excavated will be decontaminated by a high pressure water wash and either re-used on Site as a temporary cover, or be disposed of off Site. Liners will be wipe sampled to determine requirements for off-Site disposal of the material. The removal of liners will be co-ordinated with excavation and removal activities to minimize the quantity of surface run-on/run-off and to minimize the potential for erosion of the exposed surfaces. Liners will be cut into suitable sizes for ease of disposal.

4.5 EXCAVATION OF INSITU SOIL

4.5.1 Excavation Criteria

As presented in the Phase III Removal Action Plan, the excavation criteria is a tiered criteria based on

the concentrations of PCBs determined from the confirmatory sampling and analysis program. Final excavation depths for insitu soils will be determined from the following criteria:

i) a maximum concentration of 10 mg/kg of total PCBs for all affected soils to a depth of 3.5 feet below the final restored grade, provided the soil is covered with a minimum 10-inch thick layer of clean soil; and

ii) a maximum concentration of 25 mg/kg of total PCBs for all affected soils at a depth in excess of 3.5 feet below the final restored grade.

All insitu soil excavated to achieve the above criteria will be considered residually contaminated and will be transported and disposed off Site as specified in Section 6.

4.5.2 General Excavation Protocols

Insitu soil and sediment with residual PCB concentrations in excess of the cleanup criteria will be excavated and either taken to a temporary staging area or loaded directly into haul units for off-Site disposal. Staging operations may be required in the event that off-Site

transportation cannot keep pace with excavation activities. Staging, if required, will utilize the existing interim storage cells and will be co-ordinated with the removal of existing materials stored in the cells.

A survey grid will be established over the excavation areas prior to initiation of excavation activities to establish horizontal control. Excavation will proceed to the initial excavation depths shown on Plan 3. Excavation will be suspended once the initial excavation depth is reached over each area or subarea shown. Soil samples will be collected from the excavated surface as specified for the confirmatory soil sampling and analysis program (Section 5) and analyzed to determine the need for further excavation. Based on the results of the confirmatory sampling and analysis program, the Engineer will either direct additional excavation or permit backfilling of the area to commence. Where additional excavation is required to achieve the cleanup criteria, subsequent rounds of sampling and analysis will be conducted as necessary to demonstrate that cleanup criteria are met.

The excavation depth tolerances will be within three inches greater or lesser than the depths as directed by the Engineer. The Contractor will be responsible for scheduling excavation of subareas such that machinery can return to an open excavation for additional work without potentially cross-contaminating clean excavated surfaces.

Excavation equipment will be decontaminated periodically and as directed by the Engineer. Equipment will be decontaminated when visibly contaminated or when moving from a significantly contaminated area to one of lesser contamination for excavation work. Equipment will also be decontaminated prior to performing additional excavation in an excavation previously left open pending sampling and analysis.

Excavation areas will be graded or diked to prevent run-on of surface waters. Any water which collects on potentially contaminated excavation surfaces will be transferred to the on-Site wastewater storage/treatment system. Waters which collect on clean or lined surfaces may be collected and rerouted to a point downgradient of the Site.

Shoring may be required to access deeper excavations and to maintain stable excavation faces. Shoring, if required, will be in compliance with all applicable OSHA safety standards. The Contractor will be responsible for ensuring that safety standards are met. Any shoring installed, will be pulled during backfilling and the shoring materials will be decontaminated prior to reuse or removal from Site.

Intact capacitors encountered during excavation of insitu and staged soil will be segregated as specified in Section 4.7. Capacitor components will not be segregated from the soil matrix.

The Contractor will be responsible for co-ordinating excavation activities within the Site fence with other demolition and/or removal operations.

4.5.3 Excavation Outside of Site Fence

The excavation of areas outside of the Site fence alongside the State Road, Terra's facilities, and Superior's facilities will be co-ordinated with the property owners and applicable authorities to minimize the duration of the interference. These excavation areas will be demarcated by temporary snow fencing and will be guarded by security personnel until the excavations are complete and backfilled.

4.5.4 Excavation of Ravine Soil and Sediment

A minimum of 10 inches of soil and any overlying sediment will be removed from the invert of the ravine where residual PCB contamination in the soil exceeds cleanup criteria. The excavation and handling of soil/

sediments from the ravine as well as the sampling of remaining soil to confirm cleanup criteria have been achieved will be consistent with the procedures and protocols outlined in the foregoing sections.

Oil absorbent booms and straw bale sediment dikes will be removed and loaded with excavated soil as excavation progresses.

Water will be prevented from running onto the excavated surfaces. Excavated surfaces will either be kept covered with temporary liners or water which collects upstream of an active excavation will be intercepted and diverted around the area.

4.6 EXCAVATION OF UNDERGROUND PIPES

Potentially contaminated and contaminated buried pipes delineated during previous investigations will be excavated as shown on Plan 3 for off-Site disposal with the residually contaminated soil.

Excavation will proceed using trench excavation methods; the length of the open trenches will be limited to minimize water run-on and potential safety hazards. Excavation will be to a depth approximately

one foot below the invert of the pipe. The width of the trench will be sufficient to remove all the pipe bedding material encountered. Buried pipes will be removed with the excavated soil. Pipes which are not broken and intermixed with the excavated soil, such as thick plastic pipe or corregated metal, will be reduced to minimum volume prior to disposal.

During excavation, overburden soil will be placed alongside the trench. Depending on the volume of overburden soil removed to access the pipe and bedding, the Engineer may collect samples from the stockpiled overburden soil for PCB analyses.

Stockpiled overburden with PCB concentrations in excess of the cleanup criteria will be disposed of off-Site; soil meeting the cleanup criteria may be placed back into the excavated trench as backfill.

Excavating equipment will be decontaminated after handling contaminated piping and bedding prior to handling backfill materials or overburden to be placed as backfill.

4.7 SEGREGATION AND HANDLING OF STORED MATERIALS

Materials to be removed from Site which are currently stored on Site include the materials in the debris containment cell, soil in interim storage cell 2, mixed soil and debris in interim storage cell 1, and soil in the soil stockpile.

Soil will be excavated from the containment structures and loaded for off-Site disposal with excavated insitu soil. Debris intermixed with soil will be considered contaminated and will be loaded out with the soil.

Large items of debris may be segregated and decontaminated with a high-pressure water wash. Following decontamination, these items will be wipe sampled; the analytical results will determine the appropriate means of disposal. Alternatively, large items of debris will be crushed to reduce their volume and loaded out with contaminated soil.

Intact capacitors will be segregated from the mixed soil and debris stored in interim Storage Cell 1. The capacitors will be segregated using hand tools such as shovels and placed into DOT approved 55-gallon steel drums. No direct handling of capacitors will be permitted. Capacitors will be packaged in vermiculite or equivalent absorbent medium for off-Site transport and disposal.

4.8 BACKFILLING OF EXCAVATIONS

Imported fill will be used for backfilling all excavations with the possible exception of clean overburden to be placed back into trench excavations. Backfill material will be obtained locally and will be free of undesirable material such as vegetation, foreign materials, and chemicals. Backfill material will be sampled and analyzed to ensure that it is not contaminated with PCBs, herbicides/pesticides or other chemicals prior to use.

Backfill materials brought to Site will be temporarily stockpiled, if necessary, away from possible sources of contamination. Only decontaminated equipment will be permitted to handle clean backfill. Backfill will not be placed directly against potentially contaminated adjacent surfaces. Where the potential for cross-contamination exists, a lining material will be placed to separate the backfill from the adjacent soil or backfilling will be delayed until the adjacent soil is removed or confirmed clean.

Backfill will be placed in uniform layers not exceeding 12-inches loose thickness to return excavations to pre-removal grades. Each layer will be compacted to 95% Standard Proctor Density determined in accordance with ASTM D698. The Contractor will be responsible for engaging

an independent testing agency to demonstrate that the compaction requirements are satisfied. Where backfilling to pre-excavation grades is difficult or impractical such as on ravine sideslopes, backfilling will provide a minimum layer of 10-inches of compacted clean soil.

Backfilling of excavated surfaces may begin once the initial sub-area analyses confirm clean-up criteria have been achieved. In the event of a discrepancy between CLP and non-CLP data, the CLP data shall govern. If necessary, previously backfilled surfaces will be re-excavated to permit re-sampling or additional excavation if CLP data conflicts with initial data and indicates an excursion above the cleanup criteria.

4.9 DEMOLITION/REMOVAL OF MISCELLANEOUS STRUCTURES

Existing structures to be removed due to residual PCB contamination or to provide access to soil to be excavated include the Site incinerator, pumphouse, existing decontamination pad and all or portions of the existing plant slab.

The incinerator, pumphouse and portions of the slab where PCB concentrations exceed cleanup criteria will be demolished and the rubble will be handled in the same

manner as the PCB-contaminated soil. As specified in the Phase III Removal Action Plan, the cleanup criteria for concrete structures will be 10 mg/kg of total PCBs.

Core samples will be collected from the remaining portions of the slab to identify areas which do not meet cleanup criteria and require demolition and disposal. The concrete core sampling program is detailed in Section 5.

In the event that the top layer of concrete does not meet the cleanup criteria although the underlying portion of the concrete core does, the top layer of concrete will be scarified and removed for disposal. The remaining underlying portion of the concrete slab will be left in place and resampled to confirm clean-up criteria have been achieved.

Concrete (if intact), and synthetic materials used in containment facilities constructed during Phase I and II will be decontaminated and wipe sampled to determine the appropriate disposal method for this material in accordance with the criteria specified in Section 6. Concrete which has weathered or is broken up will be core sampled to confirm appropriate disposal methods. Decontamination of intact concrete structures will include high pressure washing with hot water supplemented by detergents. Decontamination wash waters will be collected for disposal.

The demolition of concrete structures will be coordinated with excavation and disposal operations. The existing decontamination pad will not be demolished until another temporary facility is constructed and available for the decontamination of equipment.

4.10 PREPARATION OF OFF-SITE TRANSPORT VEHICLES

All off-Site transport vehicles will be prepared as appropriate prior to receiving waste materials. The specific protocols which will be followed include the following:

i) Truck Staging Area: This area will be used to inspect vehicle and safety equipment. At this point, the driver will put on all required safety gear (respirator around neck), undo rubber snubbers on tarps, and await his turn to enter the lining station.

ii) Lining Station: At this station, a polyethylene liner will be placed into the truck bed(s) by Contractor personnel. The driver will remain in the truck, roll up all windows, and put on a respirator in preparation for entering the Exclusion Zone. The driver will not pull out of the lining station until he is signaled to do so,

and only when all of the lining personnel are visible and the scaffolding. The truck will then proceed to the loading area as directed.

iii) Loading Area: After leaving the lining area and the truck has crossed over into the Exclusion Zone, the driver will not roll down the windows, open doors or remove respiratory equipment. The loader operator will blow the horn to signal the truck is in position and when the truck is to stop. After the loading is complete, another blow on the horn will signal the truck to pull to the next station. Packaged and drummed wastes will be loaded and secured in a manner which will prevent damage to the containerized materials.

iv) Weigh Scale: The truck will stop before pulling onto the scale and then pull into the scale slowly. The loaded weight of the materials will be used to ensure compliance with transportation regulations and determine the weight of materials for the purpose of manifesting. Transport units which do not meet the permissible load criteria for the State of Indiana or additional criteria which apply in other States where transport will occur will have their loads adjusted. If the load needs to be adjusted, the driver will be instructed as to the procedure to follow. Either he will be instructed to return to the loading area or a loader will bring

additional material to the truck at the scale area. The trucks will be required to weigh prior to loading, unless certified weights for each truck used on the project can be determined.

v) Tarping Station: At this station, the drivers will remain in their trucks. Contractor personnel will tarp the trailer. Prior to leaving all tarping personnel will be visible on the scaffolding. A weatherproof tarp will be provided and secured over each shipment leaving Site. Exceptions will only be made for enclosed box transport units.

vi) Decontamination Station: After weighing out and tarping, the truck will pull forward to the decontamination station. Decontamination personnel will direct the truck as to where to stop. The truck will not proceed to the next station unless they are directed to do so by the decontamination personnel. Each vehicle will be decontaminated to ensure that no loose soil or other material is tracked off Site. Particular attention will be paid to removing materials from tires, undercarriages, and portions of vehicles which may have been in contact with waste materials during loading operations.

vii) Manifest Station (Shipping Papers): Finally, trucks will pull up to the gate at the chain link fence. At this point, drivers will remove their safety gear. All disposable items will be put in containers provided. Drivers will be issued the signed manifest, and tarps will be checked one last time prior to leaving for the disposal facility.

5.0 CONFIRMATORY SAMPLING AND ANALYSIS PLAN

5.1 GENERAL

Concurrent with removal activities, a confirmatory sampling and analysis program will be conducted to ensure that cleanup and disposal criteria are met. Soil, sediment, concrete core, and wipe samples will be collected to ensure that residual PCB concentrations remaining in material at the Site are within acceptable limits. In addition, decontaminated materials and any liquids generated during removal activities will be sampled to determine their appropriate method of disposal.

5.2 SAMPLING PROCEDURES AND PROTOCOLS

5.2.1 Confirmatory Soil and Sediment Sampling

5.2.1.1 General

Immediately following excavation of an area to its initial excavation depth, soil samples will be collected from the excavation surface and analyzed for PCBs to confirm that the cleanup criteria has been met. Samples will be collected in accordance with the following protocols.

.1 Soil Samples

Soil samples will be collected as follows:

i) excavation areas will be sub-divided into 50 foot by 50-foot or equivalently sized sampling areas;

ii) each sample area will be further divided into approximately four sub-areas;

iii) one sample will be collected from each sub-area and each of the four sub-area samples will be split. A split portion from each sub-area will be reserved for compositing into one sample for confirmatory analysis for the sample area;

iv) sub-area samples will be collected from the upper six-inch layer of exposed soil.

An initial analysis of the collected sub-area samples will be performed within 48 hours to determine whether cleanup criteria have been achieved. If any of the samples exceed the cleanup criteria, an additional six to twelve inches of soil will be excavated from the sub-area(s) showing PCBs above the cleanup criteria. Additional samples will then be collected from the re-excavated sub-areas as described above and the PCB analyses repeated. Additional

rounds of excavation and sampling will be performed until sample analyses indicate the cleanup criteria have been achieved. The initial analyses will be consistent with USEPA SW-846, "Test Methods for Evaluating Solid Waste", 3rd Edition, November 1986, Method 8080. The initial analyses, also referred to as confirmatory screening analyses, may be conducted either off Site or on Site in an on-Site laboratory.

The remaining split portions of the sub-area samples, which confirmed cleanup criteria were achieved, will be composited and submitted to a qualified laboratory for subsequent PCB analyses in accordance with USEPA Contract Laboratory Program (CLP) protocols. These analyses will be conducted by a USEPA CLP approved laboratory.

In the event of a discrepancy between CLP and non-CLP data, the CLP data shall govern. If necessary, surfaces previously backfilled, on the basis of confirmatory screening analyses, will be re-excavated to permit re-sampling or additional excavation if CLP data conflicts with initial data and indicates an excursion above the cleanup criteria.

In addition to confirmatory soil sampling following excavation, additional investigative soil sampling will be carried out in a number of other areas of the Site to

further assess the areal distribution of potential PCB contamination. If PCB concentrations in excess of the cleanup criteria are found to exist in any of these areas, an initial excavation depth will be determined and the area will be excavated. Sampling protocols will be the same as noted above for the sampling of excavated areas.

.2 Ravine Sediment/Soil Samples

Ravine sediment/soil samples will be collected as follows:

i) ravine sediment/soil excavation areas will be subdivided into sampling areas approximately 160 feet in length.

ii) each sample area will be further divided into four sub-areas, with sediment/soil samples being collected at consecutive 40-foot intervals.

iii) one sample will be collected from each sub-area and each of the four sub-area samples will be split. A split portion from each sub-area will be reserved for compositing into one sample for confirmatory analysis for the sample area.

iv) the sequencing of analyses and determination if cleanup criteria have been achieved will be consistent with the procedures and protocols outlined in the preceding section for soil samples.

5.2.1.2 Equipment Decontamination

All sampling equipment which may come in contact with potentially contaminated materials will be decontaminated prior to field use to prevent cross-contamination of samples. Duplicate samples will be collected concurrently with original samples, therefore, sampling equipment will not be decontaminated before collection of the duplicate. Decontamination will be performed as follows:

1. clean water wash and scrub with a bristle brush to remove all visible foreign matter,
2. rinse with deionized water,
3. rinse with reagent-grade acetone,
4. rinse with 1,1,1-trichloroethane, and
5. air dry on a clean plastic sheet.

Fluids used for cleaning will not be recycled. All wash water, rinse water and decontamination fluids will be contained in DOT approved drums for disposal.

5.2.1.3 Soil and Sediment Sample Collection

Confirmatory soil and sediment samples will be collected with a split spoon sampler or by hand as outlined below. At vegetated sample stations where additional investigative soil samples are required, samples will be collected from below the vegetative root mat by first cutting away the mat with a clean utensil.

.1 Split-Spoon Samples

A split spoon sampler will be used to retrieve soil and sediment samples, as outlined below:

1. A new pair of disposable latex gloves will be used at each sample location.

2. Prior to use at each sample location, all sampling equipment will be decontaminated shall be cleaned in accordance with Section 5.2.1.2.

3. A split-spoon sampler will be manually driven into the ground to a depth greater than the required six-inch depth for sampling.

4. The split-spoon sampler will be retrieved and opened upon a clean sheet of polyethylene or aluminum foil.

5. Using a clean cutting tool, the collected section below the required sample interval will be removed from the bottom of the core. The remaining core will be removed and homogenized in a clean stainless steel bowl prior to sample collection to jars. Each jar sample will be removed from the homogenized material using clean stainless steel spoons or other appropriate sampling equipment. Each sample will be placed in a prelabeled 250-mL glass jar and sealed with a teflon lined cap.

6. If necessary a second core will be collected immediately adjacent to the first to retrieve sufficient material for analyses. Where a second core is required for analyses or as a duplicate sample, the collected samples shall be composited and homogenized in a clean stainless steel bowl prior to being placed in the sample jars.

7. Samples which are to be collected for investigative purposes and consequently do not need to be split will be collected as follows. The bottom of the collected sample will be trimmed as specified in Item 5. The remaining core will be cut in half longitudinally. A continuous vertical sample will be collected from the center of the exposed face of the core sample. The sample will be removed using clean utensils to a prelabeled glass jar.

8. All equipment used during sampling which may have come in contact with potentially contaminated soils, will be decontaminated in accordance with Section 5.2.1.2. Latex gloves used during the collection of the sample will be disposed of in accordance with Section 5.2.6.

.2 Manual Sample Collection

Manual sample collection will be performed as follows:

1. A new pair of disposable latex gloves will be used at each sample location.

2. Prior to use at each sample location, all sampling tools will be decontaminated in accordance with Section 5.2.1.2.

3. A clean stainless steel knife or spoon will be used to remove a sample over a two-inch diameter area from the upper six-inch layer of exposed soil. The collected soil will be placed directly in a clean, prelabeled 250 mL glass jar and sealed with a teflon lined cap for investigative samples. Samples to be split for confirmatory analyses will first be homogenized in a clean stainless steel bowl prior to collecting the split portions.

Field blanks and field duplicates will be collected concurrently with primary samples. The frequency at which these samples will be collected is specified in Section 5.4. Field blanks for soil and sediment samples will consist of deionized water poured over the sampling tools after they have been decontaminated. Field duplicates will be taken concurrently with the primary sample from material homogenized in a clean stainless steel bowl.

5.2.2 Concrete Core Sampling

5.2.2.1 General

The existing concrete plant slab will be sampled to determine which portions must be disposed of and the appropriate method(s) of disposal. Following removal of the overlying interim storage cells, concrete core samples will be collected on a 50-foot by 50-foot grid over the surface of the plant slab and analyzed for PCBs. The top one-inch of each core will be removed and analyzed independent of the remaining core sample. Additional core samples may be collected from the former location of the oil impregnation room to define the limits of the concrete to be removed. Concrete which does not contain PCBs at levels above the cleanup criteria will be left in place. If the upper one-inch of concrete in an area is found to be

contaminated whereas the lower portion meets the cleanup criteria, the upper one-inch of concrete will be selectively scarified and removed; the lower portion will be left in place.

5.2.2.2 Concrete Core Sample Collection

Concrete core samples will be collected using a portable four-inch diameter core drill. All collected core samples will be analyzed for PCBs.

If a core sample can be removed intact in one piece, the core will be removed from the drill bit and placed on a clean sheet of polyethylene. A precleaned concrete chisel will be used to remove a representative sample from the upper one-inch of the core. A precleaned chisel will be used in similar fashion to remove a sample representative of the lower portion of the core. Alternatively, the entire concrete core may be submitted to the laboratory and the laboratory will be instructed to divide the upper and lower portion of the core for analyses.

For core samples which crumble upon removal from the drill bit, a clean stainless steel knife or spoon will be used to remove samples which are representative of the upper one-inch and lower portion of the core.

Prior to use at each sample location, the coring bit, chisels, and sampling utensils will be decontaminated in accordance with the procedures outlined in Section 5.2.1.2. A new pair of disposable latex gloves will be used at each sample location and for the collection of samples from the upper and lower portions of the concrete core, it appropriate. Each sample will be placed in a prelabeled 250-mL glass jar and sealed with a teflon lined cap.

5.2.3. Wipe Sampling

5.2.3.1 General

Concrete and synthetic liners forming part of the interim storage cells and the decontamination pad will be decontaminated and wipe sampled to determine the appropriate method of disposal. Concrete which has weathered or is broken up will be core sampled to confirm appropriate disposal methods.

In addition, wipe samples may be collected to determine the appropriate disposition of miscellaneous metallic debris stored on Site.

5.2.3.2 Wipe Sample Collection

Wipe samples will be collected using 3-inch by 3-inch soxhlet extracted cotton gauze pads as follows:

1. An area of 0.25 square meters, if available, will be marked using a template or an appropriate measuring device.

2. The wipe samples will be obtained by wiping the area with the cotton pad first in one direction and then in a second direction perpendicular to the first. Each individual cotton gauze pad will be moistened with pesticide grade hexane prior to wiping, and wiping will be done so that no free hexane is left on the surface.

3. The cotton gauze pads will be folded with the sample surfaces facing inwards and placed in properly labeled sample jars equipped with a teflon lined lid and submitted for PCB analysis.

5.2.4 Tanked Liquid Sampling

5.2.4.1 General

Grab samples will be collected from the holding tanks containing wastewater treated in the on-Site wastewater treatment system. In addition, samples will be collected from untreated decontamination water transferred to a licensed waste tank following dismantling of the treatment system during project closeout. Samples will be analyzed for PCBs and for other parameters to be specified by the disposal facilities.

5.2.4.2 Tanked Liquid Sample Collection

Tanked liquid samples will be collected using a glass sample thief or a similar tube. Sampling equipment will not be decontaminated between collection of individual samples, but rather a new thief will be used to collect different samples.

To collect a sample, the thief will be lowered in the tank to its full depth in order to collect a sample which is representative of the entire water column. Sampling personnel will then seal the top of the lowered thief with a gloved finger and remove the thief sample from

the tank. The gloved finger will be removed from the top of the thief to break the suction seal to release the liquid into the sample bottle. The same thief will be lowered into the tank repeatedly to collect sufficient liquid for analysis. The used thief will be discarded as contaminated material.

5.2.5 Sample Handling

Each sample jar or bottle will be prelabeled, immediately before the samples are collected, with the following information:

1. project name - 1916 - Conestoga-Rovers & Associates
2. project location - Crawfordsville, Indiana
3. sample identification number;
4. date; and
5. the sampler's initials

The label will be sealed with clear plastic tape to ensure it does not peel off or become damaged.

Following collection of the sample, the lid of the sample container will be secured with electrical tape and the container enclosed in a polyethylene zip-lock bag and sealed. Each sample to be transported to the analytical

laboratory will be logged on the Sample Chain of Custody Form. Samples will be stored in a cooler and packed with appropriate material to cushion the samples during shipment. The cooler will be sealed with fibreglass strapping tape and a security seal will be placed on the cooler prior to shipping.

5.2.6 Waste Material Handling

All wash water, rinse water, and decontamination fluids generated during the sampling program will be collected and placed in DOT approved drums for disposal.

All potentially contaminated articles generated during the sampling program such as used coveralls, gloves, and sampling thiefs will be secured in plastic bags or approved drums and shipped off Site with the contaminated soils.

5.3 ANALYTICAL PROTOCOLS

All soil, concrete, air, and wipe samples collected for chemical analysis will be analyzed for PCB content in a manner consistent with the protocols established

by the methods in Table 5.1. In addition, the tanked liquids will be analyzed for Priority Pollutant VOCs, Priority Pollutant BNAs and total PCBs in accordance with the methods specified in Table 5.1.

Samples will be delivered to the contract analytical laboratory by commercial courier under approved chain of custody procedures. Laboratory personnel will complete the chain of custody form upon receipt of the samples in accordance with Section 5.4.

5.3.1 Confirmatory Screening Analyses

Split portions of soil samples to be analyzed for total PCBs content for confirmatory screening will be analyzed in accordance with SW-846, 3rd Edition, Method 8080.

5.3.2 Confirmatory Analyses

Composite confirmatory soil samples to be analyzed following confirmatory screening analyses indicating cleanup criteria have been achieved will be analyzed for PCB content using CLP protocols.

TABLE 5.1

ANALYTICAL METHODS SUMMARY

Sample	Parameter	Method for Extraction/Cleanup	Method for Analyses
Soil	Total PCBs	3540(1)/3550(1)	8080(1)
Tanked liquids	Priority Pollutant VOCs	5010/5020/5030(1)	8240(1)
	Priority Pollutant B/N/As (2)	3540/3550(1)	8270(1)
	Total PCBs	3540(1)/3550(1)	8080
Air	Total Particulate PCBs		5503(3)
	Vaporous PCBs		5503(3)
Concrete Core	Total PCBs	3540/3550(1)	8080(1)
Surface Wipe	Total PCBs	3540/3550(1)	8080(1)

Notes:

1. Test Methods for Evaluating Solid Waste - Physical/Chemical Methods, Third Edition, SW-846, United States Environmental Protection Agency, 1984.

2. Base, neutral and acid extractable compounds.

3. NIOSH Manual of Analytical Methods, Volume 1, Third Edition, NIOSH Publication No. 84-100, U.S Department of Health and Human Services.

Of the samples analyzed in this manner, equivalent Contract Laboratory Program Routine Analytical Services (CLP-RAS) QA/QC documentation will be provided. All equivalent CLP documentation will be in accordance with the USEPA CLP Statement of Work (SOW) (Rev. 8/87 for organic analyses).

5.4 QUALITY ASSURANCE/QUALITY CONTROL

5.4.1 General

The overall QA objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis and reporting that will provide accurate data. Specific procedures to be used for sampling, chain-of-custody, calibration, laboratory analysis, reporting, quality control, audits, preventative maintenance and corrective actions are presented in other sections of this document.

The purpose of this section is to define the goals for the level of QA effort; accuracy, precision and sensitivity of analyses; and completeness, representativeness, and comparability of measurement data from the analytical laboratories. QA objectives for field measurements are also discussed. The QA procedures and

protocols specified herein are consistent with the approved QAPP and subsequent approved amendments for previous phases of this project.

5.4.2 Detection Limit Requirements

The data used to conduct the response action shall have method detection limits that are consistent with the objectives of the appropriate EPA standard methods. Targeted detection limits are summarized in Table 5.2. It should be noted that specific detection limits are highly matrix dependent. Consequently, the detection limits listed in Table 5.2 are to be used as a guideline only and may not always be achievable.

These detection limits will be reported using protocols established in 40 CFR Part 136, Appendix B, October 26, 1984. Verification of the lower detection limit attainment will be achieved by sensitivity checks of the equipment using standards at concentrations of twice the targeted detection limit. The standards will be run prior to analysis of any samples for the project and weekly or following recalibration of equipment throughout project analytical activities.

TABLE 5.2

TARGETED DETECTION LIMITS FOR ORGANIC ANALYSES

VOLATILE COMPOUNDS

CAS No.	Compound	Targeted Detection Limits** Water (ug/L)	Soil/Sediment (ug/kg)
74-87-3	chloromethane	1	1
74-83-9	bromomethane	1	1
75-01-4	vinyl chloride	1	1
75-00-3	chloroethane	1	1
75-09-2	methylene chloride	1	1
75-35-4	1,1-dichloroethene	1	1
75-35-3	1,1-dichloroethane	1	1
156-60-5	trans-1,2-dichloroethene	1	1
67-66-3	chloroform	1	1
107-06-2	1,2-dichloroethane	1	1
71-55-6	1,1,1-trichloroethane	1	1
56-23-5	carbon tetrachloride	1	1
75-27-4	bromodichloromethane	1	1
78-87-5	1,2-dichloropropane	1	1
10061-02-6	trans-1,3-dichloropropene	1	1
71-01-6	trichloroethene	1	1
71-43-2	benzene	1	1
124-48-1	dibromochloromethane	1	1
79-00-5	1,1,2-trichloroethane	1	1
10061-01-05	cis-1,3-dichloropropene	1	1
110-75-8	2-chloroethylvinyl ether	1	1
75-25-2	bromoform	1	1
127-18-4	tetrachloroethene	1	1
79-34-5	1,1,2,2-tetrachloroethane	1	1
108-88-3	toluene	1	1
108-90-7	chlorobenzene	1	1
100-41-4	ethylbenzene	1	1

TABLE 5.2

TARGETED DETECTION LIMITS FOR ORGANIC ANALYSES

BASE/NEUTRAL/ACID COMPOUNDS

CAS No.	Compound	Targeted Detection Limits** Water (ug/L)	Soil/Sediment (ug/kg)
62-75-9	N-nitrosodimethylamine	1	1
111-44-4	bis(2-chloroethyl) ether	1	1
108-95-2	phenol	10	10
95-57-8	2-chlorophenol	10	10
541-73-1	1,3-dichlorobenzene	1	1
106-46-7	1,4-dichlorobenzene	1	1
95-50-1	1,2-dichlorobenzene	1	1
39638-32-9	bis (2-chloroisopropyl) ether	1	1
67-72-1	hexachloroethane	1	1
621-64-7	N-nitrosodi-dipropylamine	1	1
98-95-3	nitrobenzene	1	1
78-59-1	isophorone	1	1
88-75-5	2-nitrophenol	10	10
105-67-9	2,4-dimethylphenol	10	10
111-91-1	bis (2-chloroethoxy) methane	1	1
120-83-2	2,4-dichlorophenol	10	10
120-82-1	1,2,4-trichlorobenzene	1	1
91-20-3	naphthalene	1	1
87-68-3	hexachlorobutadiene	1	1
59-50-7	4-chloro-3-methyl phenol	10	10
77-47-4	hexachlorocyclopentadiene	1	1
88-06-2	2,4,6-trichlorophenol	10	10
91-58-7	2-chloronaphthalene	1	1
208-96-8	acenaphthylene	1	1
131-11-3	dimethyl phthalate	1	1
606-20-2	2,6-dinitrotoluene	1	1
83-32-9	acenaphthene	1	1
51-28-5	2,4-dinitrophenol	25	25
121-14-2	2,4-dinitrotoluene	1	1
86-73-7	fluorene	1	1
100-02-7	4-nitrophenol	10	10
7005-72-3	4-chlorophenyl phenyl ether	1	1

TABLE 5.2

TARGETED DETECTION LIMITS FOR ORGANIC ANALYSES

BASE/NEUTRAL/ACID COMPOUNDS (Cont'd)

CAS No.	Compound	Targeted Detection Limits** Water (ug/L)	Soil/Sediment (ug/kg)
84-66-2	diethyl phthalate	1	1
534-52-1	4,6-dinitro-2-methylphenol	25	25
86-30-6	N-nitrosodiphenylamine (diphenylamine)	1	1
101-55-3	4-bromophenyl phenyl ether	1	1
118-74-1	hexachlorobenzene	1	1
87-86-5	pentachlorophenol	10	10
85-01-8	phenanthrene	1	1
120-12-7	anthracene	1	1
84-74-2	di-n-butyl phthalate	1	1
206-44-0	fluoranthene	1	1
129-00-0	pyrene	1	1
85-68-7	butyl benzyl phthalate	1	1
218-01-9	chrysene	1	1
56-55-3	benzo(a)anthracene	1	1
117-81-7	bis (2-ethylhexyl) phthalate	1	1
117-84-0	di-n-octyl phthalate	1	1
205-99-2	benzo(b)fluoranthene	1	1
207-08-9	benzo(k)fluoranthene	1	1
50-32-8	benzo(a)pyrene	1	1
193-39-5	indeno(1,2,3-cd)pyrene	1	1
53-70-3	dibenz(a,h)anthracene	1	1
191-24-2	benzo(g,h,i)perylene	1	1
92-87-5	benzidine	1	1
91-94-1	3,3'-dichlorobenzidine	1	1
88-74-4	2-nitroaniline	1	1
122-66-7	1,2-diphenylhydrazine	1	1
1746-01-6	2,3,7,8-tetrachlorodibenzo-p-dioxin	1	1

TABLE 5.2

TARGETED DETECTION LIMITS FOR ORGANIC ANALYSES

PCBs

CAS No.	Compound	Targeted Detection Limits** Water (ug/L)	Soil/Sediment (ug/kg)
12674-11-2	aroclor 1016	0.1	100
11104-28-2	aroclor 1221	0.1	100
11141-16-5	aroclor 1232	0.1	100
53469-21-9	aroclor 1242	0.1	100
12672-29-6	aroclor 1248	0.1	100
11097-69-1	aroclor 1254	0.1	100
11096-82-5	aroclor 1260	0.1	100

** Detection limits listed for soil/sediment are based on wet weight. The detection limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, as required by the contract, will be higher.

***Specific detection limits are highly matrix dependent. The detection limits listed herein are provided for guidance and may not always be achievable.

5.4.3 Field QA/QC

To assess the quality of data resulting from the field sampling program, field duplicate samples, samples for laboratory matrix spike and matrix spike duplicate (MS/MSD) analyses, rinsate blank samples, trip blank samples and solvent and preservative blank samples will be collected (where appropriate) and submitted to the contract laboratory.

For all field primary samples collected, except the concrete core samples, QA samples also will be collected. Field duplicate samples will be collected at a frequency of one duplicate sample per ten field primary samples collected. Samples for both matrix spike and matrix spike duplicate analyses will be collected at a minimum frequency of one MS/MSD sample per 20 field primary samples collected. Rinsate blank samples will be collected at a frequency of one rinsate blank sample per ten field primary samples collected. In the event that a sampling program consists of the collection of less than ten field primary samples, a minimum of one sample will be collected for each of the field duplicate, MS/MSD and rinsate blank QA samples.

QA samples cannot be collected for core samples, since this method of sample collection is not conducive to splitting for the QA samples.

Trip blank samples for volatile organic compound (VOC) analyses only (prepared by the contract laboratory and consisting of organic free water poured into the sample vials) will be shipped by the contract laboratory to the Site at a minimum frequency of one trip blank sample per cooler of sample containers shipped to the Site containing VOC sample vials. Trip blank samples will not be handled by the personnel collecting the field samples but will be shipped back to the laboratory at a frequency of one trip blank sample each day that samples are shipped to the contract laboratory for VOC analyses.

Solvent blank samples will be collected at a frequency of once per sampling event and consists of pouring the solvents used for decontamination of sampling equipment into the appropriate sample containers. Each solvent used for decontamination (including organic free water) will be collected as individual samples. Preservative blank samples will also be collected at a frequency of once per sampling event and consists of chemicals used for preservation poured into the appropriate sample containers.

The field duplicate samples provide a measure of sampling and analytical precision. The MS/MSD samples provide a measure of the analyte recovery from the specific sample matrix and of the laboratory reproducibility, respectively. The rinsate blank samples provide a measure of

procedural contamination and/or ambient conditions and/or sample container contamination at the Site that may cause sample contamination. The trip blank samples provide a measure of potential cross-contamination of samples during shipment. The solvent blank samples provide a measure of potential foreign contamination during decontamination procedures. The preservative blank samples provide an indication of potential contamination due to use of the preservative.

5.4.4 Laboratory Quality Control Procedures

Internal quality control procedures for samples analyzed will be in a manner consistent with the protocols established by the analytical methods specified and will be in accordance with these methods. These specifications include the types of audits required (sample spikes, surrogate spikes, reference samples, controls, blanks) the frequency of each audit, the compounds to be used for sample spikes and surrogate spikes, and the quality control acceptance criteria for these audits.

Quality control procedures for field measurements are limited to checking the reproducibility of the measurement in the field by obtaining multiple readings and/or by calibrating the instruments (where appropriate).

5.4.5 Sample Custody and Document Control

5.4.5.1 Chain-of-Custody

In the field, each sample container will be properly sealed and labeled. Sample container labels will include sample number, place of collection and date and time of collection. The sample containers then will be placed in a cooler for shipment.

Each cooler being shipped to a contract laboratory will contain a chain-of-custody form. Chain-of-custody forms will be maintained to document the transfer of sample containers. A sample of the chain-of-custody form to be used is presented as Figure 5.1.

The chain-of-custody form consists of four copies which are distributed to the shipper, the receiving laboratory, the CRA laboratory, and the CRA office file. The shipper will maintain one copy, while the other three copies are enclosed in a waterproof envelope within the cooler with the samples.

The cooler then will be properly sealed for shipment.

CRA Consulting Engineers
CONESTOGA-ROVERS & ASSOCIATES
651 Colby Drive, Waterloo, Ontario Canada N2V 1C2

SHIPPED TO (Laboratory name):

CHAIN OF CUSTODY RECORD

PROJECT Nº:

PROJECT NAME:

SAMPLER'S SIGNATURE _____ (SIGN)

SEQ. Nº.	SAMPLE Nº.	DATE	TIME	SAMPLE LOCATION	SAMPLE TYPE	Nº OF CONTAINERS	REMARKS
				TOTAL NUMBER OF CONTAINERS			

ANTICIPATED CHEMICAL HAZARDS:

RELINQUISHED BY: [1] (SIGN)	DATE/TIME	RECEIVED BY: (2) (SIGN)
RELINQUISHED BY: [2] (SIGN)	DATE/TIME	RECEIVED BY: (3) (SIGN)
RELINQUISHED BY: [3] (SIGN)	DATE/TIME	RECEIVED BY: (4) (SIGN)
RELINQUISHED BY: [4] (SIGN)	DATE/TIME	RECEIVED BY: (5) (SIGN)
RELINQUISHED BY: [5] (SIGN)	DATE/TIME	RECEIVED BY: (6) (SIGN)
RELINQUISHED BY: [6] (SIGN)	DATE/TIME	RECEIVED BY: (7) (SIGN)
RELINQUISHED BY: [7] (SIGN)	DATE/TIME	RECEIVED BY: (8) (SIGN)

METHOD OF SHIPMENT:	SHIPPED BY:	RECEIVED FOR LABORATORY BY: (SIGN)	DATE/TIME
CONDITION OF SEAL UPON RECEIPT: GENERAL CONDITION OF COOLER:		COOLER OPENED BY: (SIGN)	DATE/TIME

WHITE – CRA OFFICE COPY
YELLOW – RECEIVING LABORATORY COPY
PINK – CRA LABORATORY COPY
GOLDENROD – SHIPPERS

figure 5.1
SAMPLE CHAIN OF CUSTODY FORM
SITE OPERATIONS PLAN
PHASE III REMOVAL ACTION
Crawfordsville, Indiana

Upon receipt of the cooler at the laboratory, the cooler will be inspected by the laboratory sample custodian. The condition of the cooler and seal will be noted on the triplicate chain-of-custody form by the sample custodian. The sample custodian will document the date and time of receipt of the cooler and sign the triplicate chain-of-custody form.

The sample custodian then will check the contents of the cooler with those samples listed on the chain-of-custody form. If damage or discrepancies are noticed, it will be recorded in the remarks column of the triplicate chain-of-custody form, dated and signed, then reported to the laboratory QA/QC officer who will inform the laboratory project manager.

The contract laboratory will maintain one of the three completed copies of the chain-of-custody form. Of the remaining two copies, one copy will be returned to CRA with the data deliverables package. The final copy will be returned to CRA upon disposal of the sample. Upon disposal of the samples, the laboratory shall sign the next open "Relinguished by" box and the word "Disposed" shall be written in tne "Received by" box.

Sample disposal will be the responsibility of the laboratory.

5.4.5.2 Sample Documentation in the Laboratory

The sample custodian will assign a unique laboratory identification number to each incoming sample for use in the laboratory. The unique laboratory identification number corresponding to CRA's sample identification number then will be entered into the sample receiving log and into a computerized laboratory information management system. The laboratory date of receipt also will be noted.

The contract laboratory will be responsible for maintaining analytical log books and laboratory data as well as a sample (on hand) inventory for submittal to CRA on an as-required basis. Samples will be maintained by the laboratory for a period of 30 days, under the conditions prescribed by the appropriate USEPA analytical methods, for additional analyses, if necessary. Raw laboratory data files will be inventoried and maintained by the contract laboratory for a period of six years at which time CRA will advise the laboratory regarding the need for additional storage.

5.4.5.3 Storage of Samples

After the sample custodian has prepared the log book, the chain-of-custody forms will be checked to ensure that all samples are stored in the appropriate

locations. All samples will be stored within a designated area of the laboratory and will be maintained at 4°C until completion of all analytical work or 30 days, whichever is greater.

Maximum sample holding times for each specific group of analyses are presented in Table 5.3.

5.4.5.4 Sample Documentation - CRA

Documentary files for the entire project will be inventoried and maintained by CRA and will consist of the following:

i) project logbooks,
ii) field data records,
iii) sample identification documents,
iv) chain-of-custody records,
v) correspondence from USEPA and/or IDEM which have a direct bearing on the project,
vi) report notes, calculations, etc.
vii) references, literature,
viii) miscellaneous - photos, maps, drawings, etc., and
ix) copies of all final reports pertaining to the project.

TABLE 5.3

MAXIMUM SAMPLE HOLDING TIMES

Analysis	Maximum Holding Time[1]
Liquids[2]	
Volatiles	14 days
PCBs	7 days until extraction, 40 days after extraction
BNAs	7 days until extraction, 40 days until analysis
Solids[3]	
Volatiles	14 days
PCBs	14 days until extraction, 40 days after extraction

Notes:

(1) The maximum sample holding time is calculated from the date of sample collection.

(2) Liquids - surface water and liquid wastes.

(3) Solids - soils, sediments, concrete, air sorbents and solid wastes.

The documentation file materials will be the responsibility of CRA's project manager with respect to maintenance and document removal.

6.0 OFF-SITE TRANSPORTATION AND DISPOSAL

6.1 MANIFESTING AND LABELING

All excavated bulk and packaged/drummed waste materials designated for off-Site disposal will be labelled and manifested, as required, prior to leaving Site for off-Site disposal facilities. The manifest forms and records will be consistent with 40 CFR Part 262 "Standards Applicable to Generators of Hazardous Waste" and 40 CFR Part 263 "Standards Applicable to Transporters of Hazardous Waste".

A hazardous waste generator identification number will be used on all waste manifests. The generator identification number previously provided by the USEPA to Duracell International Inc. will be used for manifesting. The Contractor will be responsible for completing all manifests and submitting them for signature. Battery Properties Inc. or their designated representative will sign the manifests prior to releasing each shipment from the Site.

Shipments of PCB materials will be marked and placarded in accordance with 40 CFR Part 761.

6.2 AUTHORIZED TRANSPORTERS

The Contractor will only use transporters which are licensed by USEPA and appropriate State and local authorities for the transport of hazardous materials. Any transporters who have not received prior approval from the Engineer will be required to provide documentation that they are licensed to transport hazardous wastes. For wastes scheduled for facilities outside of the State of Indiana, transporters will be required to provide documentation of licensing in the appropriate State(s) as well as compliance with other applicable Federal laws including DOT requirements.

6.3 TRANSPORTATION ROUTES

All transportation routes to off-Site facilities will be predetermined by the Contractor prior to commencing off-Site transport of waste materials. A primary and secondary route to each facility will be identified. The secondary route will be used only if the primary route becomes impassible due to weather and road conditions or blockage from traffic accidents. The Contractor will be responsible for consulting with the appropriate State and interstate officials as to whether any proposed routes are scheduled for construction closures which will occur during implementation of this project.

6.4 TRANSPORTATION PROTOCOLS

The Contractor will be responsible for ensuring that off-Site transportation complies with all applicable regulatory standards, including the following:

1. 40 CFR 262 - Standards Applicable to Generators of Hazardous Waste.

2. 40 CFR 263 - Standards Applicable to Transporters of Hazardous Waste.

3. 49 CFR 171 - General Information Regulations and Definitions.

4. 49 CFR 172 - Hazardous Materials Tables and Hazardous Materials Communications Regulations.

5. 49 CFR 173 - Shippers--General Requirements for Shipments and Packaging.

6. 49 CFR 174 - Carriage by Rail.

7. 49 CFR 174 - Carriage by Water.

8. 49 CFR 177 - Carriage by Public Highway.

Transport vehicle operators shall be able to verify upon request that they are trained in conformance with Federal and State regulations for non-hazardous and hazardous waste haulers.

Contaminated materials will not be permitted to be transported from the Site to an intermediate waste storage or transfer facility enroute to an approved disposal facility. The only exception will be for containerized materials which are being transferred from one mode of carrier to another as approved by the Engineer. In such instances, the Contractor shall be required to comply with 40 CFR 263.12. Transfer shall involve only the handling of containers and shall not involve the direct rehandling of contaminated materials, except in the event of an emergency.

Every load will be inspected prior to leaving the Site to ensure necessary shipping documents are complete and accurate; linings and tarps are secure; and exterior vehicle decontamination is complete.

Prior to commencing transport of contaminated materials off-Site, the Contractor shall have implemented an off-Site spill control and response plan meeting the guidelines outlined in Section 9.

6.5 OFF-SITE DISPOSAL

6.5.1 Disposition of Materials

The disposition of materials from Site will be to various off-Site facilities including hazardous waste incinerators, secure landfills, sanitary landfills, industrial wastewater treatment facilities, and POTWs. A detailed description of disposal criteria and appropriate facilities is provided in Table 6.1. In summary, materials will be disposed of as follows:

i) PCB contaminated soil, sediment, debris, and concrete rubble will be disposed of at a TSCA approved secure landfill;

ii) PCB capacitors will be disposed of at a TSCA approved off-Site incinerator;

iii) non-hazardous waste including above-grade vegetation, decontaminated synthetic liners, and decontaminated/ uncontaminated debris will be disposed of in a sanitary landfill;

iv) hazardous liquids will be incinerated and/or treated and disposed of off-Site at a permitted TSD facility; and

TABLE 6.1

DISPOSAL METHODS AND CRITERIA

	Material	Disposal Criteria	Disposal	Remarks
1.	PCB-Contaminated Soil/Sediment (excavated insitu soil/sediment, soil in interim storage cells and Phase II stockpile, drummed soil cuttings, decontamination pad sediment, mixed pipe/bedding/soil)	N/A	TSCA Landfill	Soil/sediment removed to meet cleanup criteria
2.	PCB Capacitors (stored on Site in drums, intact capacitors segregated during excavation of insitu soils/sediment and excavation of interim storage Cell 1)	N/A	TSCA Incinerator	Intermixed capacitor components and soil to be disposed with PCB contaminated soil
3.	Incinerator, Pumphouse Demolition Rubble	N/A	TSCA Landfill	--
4.	Plant Floor Slab (Concrete)	Core Samples		
		PCBs >10 mg/kg	TSCA Landfill	--
		PCBs <10 mg/kg	Leave In-place	May remove to sanitary landfill
5.	New Concrete Structures (Phase I and II interim storage cells, decontamination pad)	Intact concrete surfaces - wipe samples		
		PCBs >100 ug/100 cm^2	TSCA Landfill	May be recleaned to meet criteria for sanitary landfill
		PCBs <100 ug/100 cm^2	Sanitary Landfill	--
		Broken/porous concrete surfaces - core samples		
		PCBs >10 mg/kg	TSCA Landfill	--
		PCBs <10 mg/kg	Sanitary Landfill	--

continued....

TABLE 6.1

DISPOSAL METHODS AND CRITERIA

Material	Disposal Criteria	Disposal	Remarks
6. Cleared Vegetation			
Areas cleared for PCB soil/sediment excavation	Above 18" Height	Sanitary Landfill	--
	Below 18" Height	TSCA Landfill	--
Areas cleared for access and support areas	N/A	Sanitary Landfill	May be left for property owner to use
7. Decontaminated Synthetic Liners (plant slab liner, containment pad, debris containment cell, interim storage cells, soil stockpile, excavation area liners)	Wipe Samples PCBs >100 ug/100 cm^2	TSCA Landfill	May be recleaned to meet criteria for sanitary landfill
	PCBs <100 ug/100 cm^2	Sanitary Landfill	--
8. Debris (used oil absorbent booms and sediment traps, used personal protective equipment, debris in ravine, debris stored in debris containment cell and interim storage cells, fencing materials, wastewater treatment filter materials)	Not Sampled	TSCA Landfill	--
	If Nonporous and Decontaminated - Wipe Samples PCBs >100 ug/100 cm^2	TSCA Landfill	May be recleaned to meet criteria for sanitary landfill
	PCBs <100 ug/100 cm^2	Sanitary Landfill	--
9. Wastewaters (Treated/Untreated) (equipment decontamination, ponded excavation water, storage cell sumps, personnel hygiene facilities, stored well development waters)	PCBs <1 ppb	POTW	Any additional criteria to be specified by POTW. May be used for dust control

continued....

TABLE 6.1

DISPOSAL METHODS AND CRITERIA

Material	Disposal Criteria	Disposal	Remarks
	1 ppb <PCBs <50 ppm	Industrial Wastewater Treatment Facility (Permitted for PCBs)	May be repassed through wastewater treatment system to meet POTW criteria
	PCBs >50 ppm	TSCA Incinerator	May be repassed through wastewater treatment system to meet other criteria
10. Waste Solvent Waters (wastewaters from decontamination of sampling tools, stored waste solvents)	N/A	TSCA Incinerator	--

v) non-hazardous liquids shall be transported off Site to an appropriate facility for treatment and/or disposal in accordance with applicable regulations. Treated wastewater from the on-Site wastewater treatment system which is classified as non-hazardous based on analytical results (less than 1 ppb PCBs) may be transported to a POTW. Alternatively, the water may be used for dust control in soil staging areas and/or areas where residually contaminated soil/ sediment is being excavated, handled or loaded for disposal.

Miscellaneous metal debris, synthetic liners, and new concrete structures which are decontaminated and wipe sampled will be disposed of based on the analytical results. Materials with PCB concentrations less than 100 ug PCBs/100 cm^2 will be disposed of at a sanitary landfill. Materials with PCB concentrations greater than 100 ug PCBs/100 cm^2 will be recleaned and resampled or disposed of at a TSCA approved landfill.

6.5.2 Disposal Facilities

Battery Properties Inc. has selected the following TSCA approved secure landfills as the preferred disposal sites for PCB-contaminated soil, sediment and debris:

1. Chemical Waste Management, Inc., Emelle, Alabama.
2. U.S. Pollution Control, Inc., Grayback Mountain Facility, Utah.

Battery Properties Inc. may select alternate facilities for disposal in the event either of the above-noted facilities falls out of compliance with applicable regulations or fails to maintain operational standards and/or cost criteria acceptable to Battery Properties Inc.

Additional off-Site facilities for the incineration of capacitors and hazardous liquids and for the disposal of wastewaters will be identified by the Contractor for approval by Battery Properties Inc. prior to commencing transport to these facilities. All facilities to be identified by the Contractor will be TSCA or RCRA compliant, as applicable, and will comply with the requirements specified hereafter.

6.5.2.1 Letter of Commitment

Each disposal facility identified by the Contractor will provide a Letter of Commitment to Battery Properties Inc. The Letter of Commitment will be used by Battery Properties Inc. to evaluate the acceptability of the

proposed facility in accordance with USEPA policy contained within "Procedures for Planning and Implementing Off-Site Response Actions", dated May 6, 1985.

Each Letter of Commitment will provide the facility name and EPA Identification number, facility locations, name of responsible contact for facility, telephone number for the contact, signed letter of agreement to accept wastes as specified in this contract, the unit of measure utilized at the facility for costing purposes, and any additional waste characterization requirements.

6.5.2.2 Disposal Facility Requirements

Disposal facilities to receive contaminated materials will be in compliance with all applicable regulations, including:

1. 40 CFR 761 - Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibition;

2. 40 CFR 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities; and/or

3. 40 CFR 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities.

.1 Off-Site Incinerator

The facility shall have been inspected by the appropriate Federal and State officials responsible for the TSCA or RCRA program within six months prior to receipt of wastes from this Site.

The facility shall not have any significant regulatory violations or other environmental conditions that could affect its satisfactory operation or its ability to accept contaminated materials from the Site during the project. Such regulatory violations may include violations under TSCA, RCRA, or other Federal or State laws.

.2 Sanitary Landfill

The sanitary landfill shall be permitted by the USEPA and/or the State and/or appropriate local authorities to receive solid wastes, other than hazardous wastes.

.3 Industrial Wastewater Treatment Facility

The treatment facility shall have a RCRA permit or RCRA interim status to treat RCRA aqueous wastes and additional permits to treat aqueous wastewaters containing PCBs to a concentration of 50 ppm.

The facility shall have been inspected by the appropriate Federal and State officials responsible for the RCRA program within six months prior to receipt of wastes from this Site.

The facility shall not have any significant regulatory violations or other environmental conditions that could affect its satisfactory operation or its ability to accept wastes from the Site during the project. Such regulatory violations may include violations under RCRA or other Federal or State laws.

7.0 HEALTH, SAFETY AND SITE CONTROL PLAN

7.1 GENERAL

The work to be conducted during the Phase III Removal Action program includes the handling of contaminated and potentially contaminated materials. During the program, personnel may come in contact with PCB, CDD, and CDF contaminated soils, liquids, and articles.

All on-Site personnel will be required to comply with the health and safety requirements presented herein. This Health, Safety and Site Control Plan provides for a safe and minimal risk working environment for on-Site personnel. It also provides for emergency response procedures to minimize the potential for adverse impact of construction activities on the general public and Site control measures to mitigate the potential for migration of contaminants.

The program presented herein is consistent with approved health and safety protocols implemented during previous phases of work at the Site.

7.2 BASIS

The Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (29 CFR 1910 and 1926) provide the basis for the safety and health program. Additional specifications within this Section are in addition to OSHA regulations and reflect the positions of both the EPA and the National Institute for Occupational Safety and Health (NIOSH) regarding procedures required to insure safe operations at hazardous waste sites.

The safety and health of the public and on-Site personnel and the protection of the environment will take precedence over cost and schedule considerations for all project work. The Engineer and the on-Site Safety Officer shall be responsible for decisions regarding when work will be stopped or started for health and safety considerations.

7.3 HEALTH AND SAFETY PERSONNEL

A Site Safety Officer who will, as a minimum, be an Industrial Hygiene Technician with qualifications in occupational health, shall be on Site during all major construction activities involving excavation or securement of

contaminated material. The Site Safety Officer will report directly to a Certified Industrial Hygienist who shall be responsible for implementing and overviewing the Health and Safety Plan on a part-time basis.

The Certified Industrial Hygienist shall:

a) Be responsible for implementation of the Health and Safety Plan at the start-up of potentially hazardous work;

b) Be responsible for a pre-construction indoctrination of all on-Site personnel with regard to the safety plan and other safety requirements to be observed during construction, including:
   i) potential hazards,
   ii) personal hygiene principles,
   iii) personnel protective equipment,
   iv) respiratory protection equipment usage and fit testing, and
   v) emergency procedures dealing with fire and medical situations;

c) Oversee the Site Safety Officer's activities on a part-time basis and be available on an as-needed basis for emergency situations.

The Safety Officer shall:

a) Be responsible for daily enforcement and monitoring of the Health and Safety Plan;

b) Be responsible for assisting the Certified Industrial Hygienist in the pre-construction indoctrination of all on-Site personnel;

c) Be responsible for notifying the Engineer prior to initiation of any hazardous work;

d) Be responsible for the maintenance of separation of "Exclusion" (potentially contaminated) and "Clean" (uncontaminated) areas as described hereafter; and

e) Be responsible for maintenance of the emergency contingency plan.

7.4 MEDICAL SURVEILLANCE

Medical surveillance shall be subject to an employee's expected interval of time spent on Site.

In accordance with 29 CFR 1910.120, if an employee wears a respirator on a routine basis or as part of

routine activities for any part of 30 days during a year, then medical surveillance shall be provided to the minimum requirements specified by the examining physician.

If personnel will not be involved in Site activities as outlined above, medical surveillance shall include testing required for approval for use of a respirator in accordance with 29 CFR 1910.134 as a minimum.

The Contractor shall retain the services of a licensed physician or physician's group to provide the medical examinations and surveillance required. All pertinent Site characterization data, a copy of 29 CFR 1910.120, and a description of the intended personnel protective equipment shall be provided to the physician prior to completing medical surveillance. The name of the physician and evidence of examination of all on-Site personnel shall be provided to the Engineer prior to assigning personnel on-Site work activities involving contact with potentially contaminated materials. Contractor personnel medical approvals shall be maintained by the Contractor at the Contractor's Site office for the duration of the project.

Medical surveillance protocols shall be the physician's responsibility but shall, as a minimum, meet the requirements of OSHA Standard 29 CFR 1910.120 and 29 CFR 1910.134 for all personnel. This exam may include:

i) medical/occupation questionnaire with work history;

ii) full physical examination;

iii) screening audiometric test with otoscopic exam for wax;

iv) visual acuity measurement, including color perception;

v) pulmonary function test (Spirometry - FVC and FEV-1.0 second);

vi) resting EKG;

vii) chest X-ray (PA) read by Board Certified Radiologist (only when clinically indicated by other testing procedures);

viii) blood chemistry profile*;

ix) complete blood count with differential and platelet evaluation, including WBC, RBC, HGB, Hematocrit; and

x) urinalysis with microscopic examination.

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* Minimum Blood Chemistry Profile: Calcium, Phosphorous, Glucose, Blood Urea Nitrogen (BUN), Uric Acid, Cholesterol, Total Protein, Total Bilirubin, Direct Bilirubin, Alkaline Phosphatase, SGOT, SGPT, Sodium, Potassium, Chloride, Creatinine, Triglycerides, Albumin, Globulin, A/G Ratio, Lactic Acid Dehydrogenase (LDH) Serum Iron.

All on-Site personnel requiring full medical surveillance shall be provided with medical surveillance within a reasonable time period prior to entering the Site, and at any time there is suspected to be excessive exposure to toxic chemicals or physical agents.

The Contractor shall maintain all medical surveillance records for a minimum period of thirty (30) years and shall make those records available to personnel or governmental agencies as specified in 29 CFR 1910.20 and 29 CFR 1913.10.

7.5 TRAINING

All personnel assigned to or entering the Site shall complete training or refresher sessions. Training and refresher sessions shall ensure that all personnel are capable of and familiar with the use of safety, health, respiratory and protective equipment and with the safety and security procedures required for this Site. The training session shall be completed by the Safety Officer or other qualified professional in the presence of the Certified Industrial Hygienist.

In accordance with 29 CFR 1910.120, all employees exposed to hazardous substances, health hazards or safety hazards shall receive training including a minimum of 40 hours instruction off Site and three days of actual field experience under direct supervision. The Contractor shall provide documentation stating that all on-Site personnel have complied with this regulation. Each individual's name shall be included on this confirmatory letter. The training program shall include the following items:

i) names and personnel responsible for Site health and safety;
ii) Site specific potential hazards;
iii) use of personal protective equipment (PPE), including proper donning and doffing procedures;
iv) work practices by which the employee can minimize risks from these potential hazards;
v) safe use of engineering controls and on-Site equipment;
vi) discussion and completion of medical surveillance requirements and recognition of symptoms associated with exposure to hazards;
vii) Site control methods;
viii) on and off-Site contingency plans;
ix) decontamination procedures;
x) Site specific standard operating procedures;

xi) delineation between work zones;

xii) use of the buddy system;

xiii) scope of the intended Works for the project; and

xiv) review on-Site communications and appropriate hand signals between personnel working in the Exclusion and/or Contaminant Reduction Zone.

The Safety Officer shall be responsible for ensuring that personnel not successfully completing the required training are not permitted to enter the Site to perform work.

The Contractor shall implement a hazard communication ("Right-to-Know") program in accordance with 29 CFR 1910.1200.

Exceptions to the above may only be made by the Engineer for authorized visitors.

7.6 RESPIRATOR PROGRAM

All on-Site personnel shall receive training in the usage of, and be fit tested for, both half and full face respirators. This may include canister/cartridge and supplied air types, as appropriate.

Personnel working on Site shall be required to wear respiratory protection as determined by air monitoring and as instructed by the Safety Officer. As a minimum, all personnel shall wear full face-piece air purifying respirators when working in the Exclusion Zone.

7.7 WORK AREAS/SITE CONTROL

Specific work areas shall be delineated by fence or a flagged line as outlined below:

a) Exclusion Zone (EZ) - This zone shall include all areas where potentially contaminated soils or materials are to be excavated, handled, spoiled or covered, and all areas where contaminated equipment or personnel travel.

   The EZ shall be clearly delineated in the field prior to commencing Site work, by temporary fencing with warning signs spaced around the perimeter of the Zone warning of a hazardous work area. Temporary Exclusion Zones outside of the Site fence will be delineated by temporary fencing when working in these areas.

b) Contaminant Reduction Zone (CRZ) - This zone will occur at the interface of the EZ and Clean Support Zone and shall provide access for the transfer of construction

materials and Site dedicated equipment to the EZ, the decontamination of transport vehicles handling contaminated soil prior to leaving the EZ, the decontamination of personnel and clothing prior to entering the Clean Zone and for the physical segregation of the Clean Zone and EZ.

c) Clean Zone (CZ) - This area is the portion of the Site defined as being the area outside the zone of significant air, soil or surface water contamination. The Clean Zone shall be clearly delineated and procedures implemented to prevent active or passive migration of contamination from the work Site. The function of the Clean Zone includes:

i) An entry area for personnel, material and equipment to the Exclusion Zone;
ii) An exit area for decontaminated personnel, materials and equipment from the Exclusion Zone;
iii) The housing of site special services; and
iv) A storage area for clean safety and work equipment.

7.8 COMMUNICATIONS

Telephone service shall be provided to the Site during major construction activities. Emergency numbers including police, fire, ambulance, hospital, and appropriate

Regulatory agencies shall be prominently posted near each phone.

7.9 EMERGENCY AND FIRST AID EQUIPMENT AND SUPPLY

The safety equipment listed below shall be located and maintained within the Exclusion Zone in appropriate locations as directed by the Safety Officer.

a) portable emergency eye wash and shower
b) three twenty pound ABC type dry chemical fire extinguishers
c) two self contained air full face respirators

One hand-held emergency siren and two complete sets of Level B protective equipment shall be located and maintained in the Clean Zone.

7.10 EMERGENCY CONTINGENCY AND RESPONSE PLAN

7.10.1 Off-Site Contingency Plan

Prior to commencing work involving the excavation, handling and disposal of potentially contaminated

material, Battery Properties Inc. will coordinate the development of an off-Site emergency contingency plan. This plan is intended to provide immediate response to a serious site occurrence such as explosion, fire or migration of significant quantities of toxic or hazardous material from the site into adjacent public areas.

Coordination meetings shall be held with appropriate authorities which may include State, Engineer, Fire Department, Hospital, State and City Police, State Department of Transportation, Montgomery County Health Department and Civil Defense officials. The meetings shall identify the Emergency response coordinator through whom all information and coordination will occur in the event of an incident. Plans shall be developed, or existing plans incorporated into the master plan, for

i) evacuation of adjacent areas,
ii) fire fighting procedures,
iii) transport of injured personnel to medical facilities,
iv) priority transportation routes, and
v) coordination and/or modification of highway operations.

An emergency medical facility for non-chemical and chemical accidents shall be designated prior to commencing any work on Site.

Techniques and recommended procedures for immediate first aid emergency response will be developed with local medical facilities.

7.10.2 On-Site Contingency Plan

a) In the event of injury to on-Site personnel or contact with hazardous materials, the following protocol shall be followed:

   i) in the event ot injury, notify the Safety Officer, and the Engineer,

   ii) contact the closest medical center and describe the injury (closest medical center shall be established prior to commencing any work on site),

   iii) decontaminate personnel and administer appropriate emergency first aid, and

   iv) transport personnel to the defined medical facility along a predefined route.

b) Fire extinguishers shall be maintained in strategic locations within the Site to combat localized fires. Personnel shall be trained in fire fighting procedures

and shall be equipped with self contained air when involved in such operations.

c) In the event of significant release of toxic or hazardous vapors from any container or excavation, the source of such vapors shall be immediately backfilled or covered with fill. Equipment operators shall utilize self contained air respirators during such operations. Alternate plans of contaminant removal will be developed and submitted to the Engineer prior to recommencing work in the area.

7.11 PERSONAL SAFETY AND RELATED EQUIPMENT

All on-Site personnel shall be equipped with personal safety equipment and protective clothing appropriate for the hazardous material being handled and the nature of work being completed. All safety equipment and protective clothing shall be kept clean and well-maintained.

Safety equipment and apparel as required for general work and excavation work within the Exclusion Zone shall consist of:

a) Liquid resistant, splash resistant, full coverage, disposable outerwear including tyvek type coveralls and nitrile/butyl gloves,

b) Hardhats,

c) Safety shoes or boots,

d) Rubber overshoes or overboots,

e) Full face-piece respirators with dual vapor, and particulate filters; self-contained breathing apparatus or other supplied air system as necessary to conduct remedial action in a safe manner.

In addition to the above-noted safety equipment, all personnel directly handling capacitors, if necessary, shall be equipped with viton gloves and upgrade to a supplied air system.

Additional protective equipment usage guidelines to be implemented include:

a) All prescription eyeglasses in use on the Site will be safety glasses. Contact lenses shall not be permitted.

b) All disposable or reusable gloves worn on the Site shall be nitrile/butyl gloves with latex surgical gloves worn underneath.

c) During periods of respirator usage in contaminated areas, respirator filters shall be changed daily or upon breakthrough, whichever occurs first.

d) Footwear used on site will be work shoes or boots, and will be covered by rubber overshoes when entering or working in the Exclusion Zone or Contaminant Reduction Zone.

e) On-Site personnel unable to pass a respirator fit test shall not enter or work in the Exclusion Zone or Contaminant Reduction Zone.

f) All on-Site personnel shall wear an approved hardhat when present in the Exclusion Zone.

g) All personal protective equipment worn on Site shall be decontaminated at the end of each work day. The Safety Officer shall be responsible for ensuring individuals decontaminate personal protective equipment before reuse.

h) Duct tape shall be used to ensure that disposable coveralls and gloves are tightly secured when personnel are working within contaminated zones.

7.12 RESPIRATORY PROTECTION

Respiratory protection, as appropriate for all on-Site personnel, shall be mandatory during all on-Site construction activities. As a minimum, all on-Site personnel shall be required to wear full face-piece air purifying respiratory protection when working in the Exclusion Zone.

Levels of respiratory protection have been chosen consistent with potential airborne hazards. The selection of appropriate protection is based upon the potential presence of compounds with the lowest recommended threshold limit value.

In the absence of additional air monitoring information, the following levels of respiratory protection shall be required when working in the Exclusion Zone:

Total Organic Vapor Concentration (ppm)	Level of Respiratory Protection Required
0 - 25	Full face air purifying protection
greater than 25	Supplied air system or suspend activities

All major equipment, handling potentially contaminated soils, shall be equipped with a source ot compressed air for air supplied respirators, should they be required.

The Safety Officer shall be responsible for implementing, maintaining and enforcing the respirator program.

On-Site personnel unable to pass a respirator fit test will not be permitted to enter or work in the Exclusion Zone or Contaminant Reduction Zone.

7.13 PERSONAL HYGIENE

The Safety Officer shall be responsible for, and ensure that all personnel performing or supervising remedial work within a hazardous work area, or exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids, observe and adhere to the personal hygiene-related provisions of this section.

On-Site personnel found to be disregarding the personal hygiene-related provisions of this plan will be barred from the Site.

The following equipment/facilities shall be provided for the personal hygiene of all on-Site personnel:

a) Suitable disposable outerwear, gloves, and footwear on a daily or as-needed basis for the use of on-Site personnel,

b) Contained storage and disposal for used disposable outerwear,

c) Personnel hygiene facilities complete with change area, showers, toilets and washbasins with contained storage for all wash waters,

d) Lunch area, and

e) A smoking area.

The following regulations for personnel working within the Exclusion Zone will also be enforced:

a) On-Site personnel shall wear disposable outerwear and gloves at all times whenever entering or working in the Exclusion Zone or Contaminant Reduction Zone.

b) Used disposable outerwear shall not be reused, and when removed, will be placed inside disposable containers provided for that purpose.

c) Smoking shall be prohibited except in a designated smoking area.

d) Eating and drinking shall be prohibited except in the designated lunch or break area.

e) Soiled disposable outerwear shall be removed prior to entering the lunch area, and prior to cleansing hands.

f) On-Site personnel shall thoroughly cleanse their hands and other exposed areas before entering the smoking or lunch area.

g) All personnel involved in excavation and/or handling of potentially contaminated soils in the Exclusion Zone or Contaminant Reduction Zone shall shower and change to street clothes prior to leaving the Site.

7.14 AIR MONITORING

7.14.1 Protocols

During the progress of active remedial work, air quality shall be monitored in and around each active work location. Sampling shall be conducted on a regular periodic basis, and additionally as required by special or

work-related conditions. Air leaving the active work locations shall be monitored by downwind air sampling. Air sampling shall be conducted for particulates (Total Suspended Particulates; Total PCB) and VOC vapors. Any departures from general background shall be reported to the Engineer who will, in conjunction with the Safety Officer, determine when operations should be shut down and restarted.

Instruments required for air monitoring shall include an organic vapor photoinizer or organic vapor analyzer, explosimeter, personal dust monitors, and a continuous total organic vapor monitor alarm.

Contractor air monitoring equipment shall be operated by personnel trained in the use of the specific equipment provided and shall be under the control of the Safety Officer. All monitoring equipment used within the Exclusion zone shall be intrinsically safe.

Should the organic vapor level in any active working location exceed 100 ppm for any single reading, or 50 ppm for any two successive readings, or should the explosimeter indicate in excess of 20 percent of the lower explosive limit on any single reading, then that work location shall be shut down and evacuated upwind. The agency representative will be advised of these situations. Work shall not resume at such a work location until authorized by the Engineer and Safety Officer.

Personal dust monitors shall be located upwind and downwind of activities involving the handling of contaminated material and on the highest risk person at both the interim storage cell and the contaminated soil excavation areas. Samples collected shall be analyzed on a daily basis for total suspended particulates (TSP). Results of the TSP analysis shall be verbally given to the Engineer within 24 hours of sample collection. Samples which show an excursion over 150 ug/m^3 shall be analyzed for total PCB.

The Contractor shall be responsible for appropriate respiratory protection during all work activities. As a minimum, the Contractor shall ensure that all personnel working within or adjacent to an active work location are supplied with and use full face-piece respiratory protection as required.

A wind direction indicator shall be installed by the Contractor at each active work location.

7.14.2 Reporting

The results of air monitoring programs shall be reported on specific forms and shall include the following information:

i) Site Location/Date

ii) Work Process/Operation Name

iii) NIOSH Method Used

iv) Air Flow Calibration Record

v) Temperature, Pressure, Humidity at Sample Location

vi) Area Sampling Location Diagram

vii) Personal Samples

- Name of Worker
- Location of Workers

viii) Area Sample Description/Location

ix) Sampling Data

- Pump I.D.
- Flow Rate
- Sample Filter/Tube Number
- Pump On/Off (time)
- Volume Air Collected (liters)
- Lab Sample Number

x) Analysis Results (mg/m^3, ppm)

xi) Field Notes

- Description of Operations and Complaints/Symptoms
- Chemicals/Materials/Equipment in Use
- Engineering/Administration Controls in Effect
- Personal Protective Equipment in Use
- Sampling Observations/Comments

xii) Sample Submission

- Name, Location
- Chemist/Industrial Hygienist Name

- Principal Air Monitor
- Reviewed by

In addition, all daily air monitoring activities shall be recorded in a hard cover log book which will be maintained on Site at all times by the Safety Officer. Copies of the daily air monitoring reports will be provided to the on-Site agency representative on a weekly basis.

7.15 CONTAMINANT MIGRATION CONTROL

To prevent the migration of potentially contaminated material both on Site and off Site, vehicle travel shall be restricted as shown on Plan 2.

All vehicles and equipment used in the Exclusion Zone shall be decontaminated in the Contaminant Reduction Zone prior to leaving the Site and for any work outside of fenced areas. The Engineer will certify that each piece of equipment has been decontaminated prior to removal from the Site.

Decontamination shall involve the thorough cleaning of equipment with a high pressure steam cleaning unit, and shall be performed at the decontamination pad.

Decontamination wash waters shall be collected and contained in an on-Site storage tank. Wash waters will be sampled prior to disposal in accordance with State and Federal regulations.

Personnel engaged in vehicle decontamination shall wear protective equipment including disposable clothing and respiratory protection.

7.16 PARTICULATE EMISSION CONTROL

During construction, a dust control program shall be implemented and strictly enforced to minimize the generation and potential off-Site migration of fugitive particulate emissions. Excavations and excavated material shall be kept moist while uncovered due to Site activities. Treated decontamination wash waters from the wastewater treatment facilities may be used to keep excavated material moist.

All roadways, designated work areas and other possible sources of dust generation shall be controlled by application of water as required.

7.17 POSTED REGULATIONS

"No Smoking" signs shall be posted at the Site entrance and on the perimeter of the Exclusion Zone in addition to signs which state "Warning, Hazardous Work Area, Do Not Enter Unless Authorized". In addition, a notice directing visitors to the office will be posted at the Site entrance.

Safety regulations and safety reminders will be posted at conspicuous locations throughout the Site.

7.18 SAFETY MEETINGS

The Safety Officer will conduct weekly safety meetings which will be mandatory for all Site personnel. The meetings will provide refresher courses for existing equipment and protocols, and will examine new Site conditions as they are encountered.

Additional safety meetings will be held on an as required basis.

Should any unforeseen or Site peculiar safety related factor, hazard, or condition become evident during the performance of work at this Site, it will be brought to

the attention of the Engineer in writing as quickly as possible, for resolution. In the interim, prudent action shall be taken to establish and maintain safe working conditions and to safeguard employees, the public, and the environment.

7.19 SITE SECURITY

The Site shall be secured on a 24-hour basis when portions of the Site security fence have been dismantled for construction and, additionally, on an as-required basis when vehicles must frequently pass through the access gates. Security may include an unarmed guard as deemed necessary by the Engineer.

As part of the Site security, the Engineer or Safety Officer shall:

a) Limit vehicular access to the Site to authorized vehicles and personnel only,

b) Maintain a visitors and Site personnel sign-in/sign-out log, and a log of all security incidents, and

c) Provide initial screening of Site visitors.

8.0 ENVIRONMENTAL CONTROL

8.1 SITE LIGHTING

Adequate Site lighting will be provided to facilitate performance of the work and to maintain a safe working condition. As a minimum, area lighting will be provided in the office area and the decontamination area.

8.2 SURFACE WATER CONTROL

All excavation, backfilling and staging operations will be carried out in the dry.

Surface water runoff will be prevented from entering excavations using dikes, sandbags, ditching or other available means. The methods used will be subject to the approval of the Engineer. Surface water runoff which may potentially contain waste constituents will not be discharged to water courses. All surface runoff will be contained and stored in the wastewater storage tanks.

All the necessary equipment appropriately sized to keep excavations and the staging cell free from

water will be available on-Site. Collected excavation waters will be transferred to the wastewater storage tank. There will be at all times sufficient pumping equipment, machinery and tankage in good working condition for all emergencies, such as power outage, and there will be competent workers available at all times for the operation of the pumping equipment.

Precipitation will be prevented from infiltrating or from directly running off stockpiled excavated waste materials. Excavated materials will be covered with an impermeable liner during periods of work stoppage including at the end of each working day. Any liquids generated from stockpiled waste materials will be contained and transferred to the wastewater storage tanks.

8.3 SNOW AND ICE CONTROL

Snow and ice accumulated on or in excavation areas will be disposed of in an on-Site snow corral. Snow accumulated on areas prior to excavation and on excavated surfaces will be removed to the snow corral in a manner approved by the Engineer. The snow corral will be located in the Exclusion Zone in an approved location. Snow fencing will be erected around the snow pile to prevent wind drift. Hay bales will be placed continuously along the downslope

perimeter of the snow pile to control sediment. Alternatively, a silt fence may be placed around the snow pile.

8.4 SEDIMENT CONTROL

Sediment migration from any stockpiled soil will be controlled as necessary using silt fencing or hay bales. Sediment controls will be placed in downslope positions from soil stockpiles.

8.5 GENERAL HOUSEKEEPING

Daily accumulations of solid waste material such as discarded safety equipment, debris and rubbish will be collected in garbage bags and properly disposed of periodically.

Uncontaminated solid waste material will be disposed in a designated area segregated from the solid waste removed from the contaminated area. Trash removal services will be provided on a weekly basis for uncontaminated solid waste.

The Site will not be allowed to become littered with trash and/or waste materials from the Exclusion Zone; but will be maintained in a neat and orderly condition throughout the construction period. On or before the completion of the work, rubbish of all kinds will be removed from any of the grounds which have been occupied.

9.0 SPILL CONTROL AND RESPONSE

9.1 SCOPE

During all active work at the Site involving the transport and handling of contaminated materials, the Contractor will be required to implement and maintain an on-Site and off-Site Spill Control and Response Plan. This plan, which will incorporate the guidelines presented herein will provide contingency measures for potential releases of bulked solids and liquids and other miscellaneous waste potentially handled on Site.

9.2 MATERIAL HANDLING

9.2.1 Bulked Solids and Liquids

All vehicles provided for the handling of bulked solids and liquids will be required to be in a good state of repair and will be operated in a safe manner to prevent spills during handling. Tankers which will be used for hauling bulked liquids must be licensed for that purpose and must be inspected to ensure that all valves, manways and other access ports are secured to prevent leaks. Haulage units used for bulked solids (ie. soil, concrete rubble, etc.) will be inspected to ensure that their tailgates are

secured and the loads are tarped to avoid spillage or tracking of excavated material.

9.2.2 Drummed Wastes

The handling and transport of drummed waste (ie. drummed capacitors, spent solvent rinse waters) will be, at all times, conducted in a controlled and safe manner which will minimize damage to structurally sound containers. If during transport or handling, leakage or spillage of waste occurs, the drums will immediately be placed within an overpack unit. Overpack units will be provided on Site adjacent to work areas.

9.2.3 Equipment

The following equipment will be available on Site and used for any unexpected spills:

i) sand, clean fill or other non-combustible absorbent;
ii) front end loader or other machine;
iii) drums (55 gallons); and
iv) shovels.

Hand tools which are used will generally be discarded with the waste material unless it is determined appropriate to decontaminate the tools. If tools are decontaminated, they will receive a detergent wash in addition to steam cleaning or hot water washing.

9.3 ON-SITE CONTINGENCY PLAN

In the event that a release occurs on Site, the following protocols will be implemented:

i) Notification of Release: If the release is reportable, and/or human health or the environment are threatened, then the National Response Center and the Indiana Department of Environmental Management will be notified as soon as possible.

ii) Decontamination Procedures: Decontamination procedures may be required after cleanup to eliminate traces of the substance spilled or to reduce it to an acceptable level. Complete cleanup may require removal of affected soils. Personnel decontamination will include showers and cleansing or disposing of clothing and equipment as appropriate. All contaminated materials including solvents, clothes, soil, and wood that cannot be decontaminated must be

properly containerized and labeled, if appropriate, and properly disposed of as soon as possible.

iii) A release report will be submitted which will include final disposal location of all spilled material.

If a major release of material stored in a tank or container occurs on Site, the following actions, if applicable, will immediately be taken:

i) Notify the Engineer and Site Safety Officer;
ii) Take immediate measures to control and contain the release within the Site boundaries;
iii) Keep unnecessary personnel away, isolate the area of release, and deny entry;
iv) Do not allow anyone to touch released material;
v) Stay upwind; keep out of low areas; and
vi) Keep combustibles away from the released material.

Upon implementing these procedures, the Site Safety Officer will scan the immediate areas of the release, including downwind, with the HNu to identify the level of protection required for personnel safety equipment to clean up the released material. As a minimum, personnel will wear all specified protective clothing including full-face respirators. Air monitoring completed by the Site Safety Officer will determine the need to increase the level of

respiratory protection. The air monitoring action levels as presented in the HASP will be followed during any clean up of a release.

Solid releases from drums will be placed into approved containers and covered. Each container will be labelled as to contents and will be disposed of as soon as possible. Solid spills from haulage units will be placed back into haulage units and disposed of as bulked material.

Liquid spills will be first covered with an approved absorbent to absorb any free liquids to minimize the amount that may infiltrate into the ground. The absorbent material and soils contacted by the spill will be excavated and placed in approved containers. Containers which are generated will be labelled as to contents and disposed of as soon as possible.

All native soil in which a release occurs outside the Exclusion Zone will be sampled following cleanup of the spill to determine the quality of the cleanup. Samples will be collected only over the immediate area of the spill. Collected samples will be analyzed only for PCBs. Sampling and analytical protocols will be in accordance with those used for the confirmatory soil sampling and analysis program.

9.4 OFF-SITE CONTINGENCY PLAN

If a release of material from a transport vehicle occurs while in transit, the following actions will be taken to reduce potential migration of the waste material.

i) Immediately notify the Contractor, who will in turn notify the Engineer;

ii) Take immediate measures to control the release, if necessary;

iii) Contain and eliminate the release, if possible;

iv) The driver must remain with the vehicle, and will keep unnecessary people away, isolate the area of the release and deny entry to unauthorized personnel;

v) Stay upwind, keeping out of low areas, and do not allow contact with the released material;

vi) Contact the local authorities and local hazardous materials response unit; and,

vii) Other actions, as advised.

Upon implementing these procedures, the same action to clean up the release will be implemented as described under the on-Site contingency plan.

10.0 SITE RESTORATION AND PROJECT CLOSEOUT

10.1 SITE RESTORATION

Site restoration activities will proceed concurrently with excavation and backfilling activities. Backfilled areas will be graded as required to re-establish Site drainage patterns and to eliminate areas where surface water can pond. All disturbed areas will be revegetated or resurfaced, as appropriate.

Revegetation will consist of the application of seed with mulch. The Montgomery County Conservation Authority will be consulted prior to selecting the seed mixture to determine the seed varietals and proportions best suited to local climatic and soil conditions.

To ensure the success of revegetation efforts, erosion control measures will be implemented where required. Ravine slopes will be protected with a cover of jute netting and the ravine base will be covered with a layer of stones. Additional precautions will include the installation of a series of straw dikes in the ravine bottom. The straw dikes will be left in place until the ravine surface is revegetated and/or stabilized.

10.2 PROJECT CLOSEOUT

The existing security fence will be dismantled, as the work progresses, in areas where it is no longer required to maintain Site security. All remaining portions of the fence will be removed upon completion of excavation/removal activities. Fence fabric will be cleaned by high pressure water wash prior to removal from the Site. Fence posts removed from excavation areas will be disposed of with the excavated soil. Fence posts removed from clean zones will be removed from the Site to a sanitary landfill.

All equipment involved in the handling of potentially contaminated soil, sediment and debris will be decontaminated in an on-Site decontamination station prior to removal from the Site. The temporary decontamination station constructed prior to removal and disposal of the existing facility will be dismantled and removed following the completion of operations requiring its use.

Decontamination wash waters will be transferred to the on-Site wastewater storage and treatment system or directly into a licensed waste tanker once the wastewater system is dismantled. Wastewater from the treatment system will be disposed of in an appropriate manner. Spent carbon filters will be disposed of with the residually contaminated soil.

All project support facilities including office trailers, health and safety trailers, temporary fencing and miscellaneous services will be disconnected and removed from the Site.

11.0 REFERENCES

Conestoga-Rovers & Associates. 1986a. Initial Site Screening: Sampling Program, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. September 1986.

Conestoga-Rovers & Associates. 1986b. Response Action Work Plan, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. October 1986.

Conestoga-Rovers & Associates. 1987a. Phase I Remedial Action Report, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. February 1987.

Conestoga-Rovers & Associates. 1987b. Hydrogeologic Investigation Interim Report, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. March 1987.

Conestoga-Rovers & Associates. 1987c. Phase I Samplng and Analysis/Report, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. April 1987.

Conestoga-Rovers & Associates. 1987d. Hydrogeological Investigation Supplemental Data Report, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. July 1987.

Conestoga-Rovers & Associates. 1987e. Phase I Supplemental Sampling and Analysis Report, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. September 1987.

Conestoga-Rovers & Associates. 1987f. Phase II Response Action Work Plan, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. November, 1987.

Conestoga-Rovers & Associates. 1988a. Phase II Remedial Action Report, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. September 1988.

Conestoga-Rovers & Associates. 1988b. Phase II Sampling and Analysis Report. Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. September 1988.

Conestoga-Rovers & Associates. 1988c. Phase II Hydrogeologic Investigation, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. September 1988.

Conestoga-Rovers & Associates. 1988d. Phase III Removal Action Plan, Former P.R. Mallory Plant Site, Crawfordsville, Indiana. Prepared for Duracell International Inc. September 1988.

NOTES:

1. AREA EXCAVATED DURING PHASE II TO A DEPTH OF 2 FT. AND SECURED WITH AN HDPE OVERLINER.
2. AREA EXCAVATED DURING PHASE II TO THE FOLLOWING DEPTHS.

SUBAREA	DEPTH (FT.)
B1	2.0
B2	4.5
B3	2.5

EXCAVATION BACKFILLED WITH IMPORT FILL ENCLOSED BY HDPE OVER AND UNDER LINERS.

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LEGEND

- TREE LINE
- TOP OF SLOPE
- STREAM FLOW
- CREEK BANK
- OW5-86 OBSERVATION WELL
- BH8-88 BOREHOLE
- PROPERTY LINE
- SECURITY FENCE
- ACCESS GATE
- OPP POWER POLE

LEGEND

- TEMPORARY FENCING OR FLAGGED LINE
- INSTALLED SYNTHETIC LINERS
- OIL ABSORBENT BOOM
- SEDIMENT TRAP

No	Revision	Date	Initial

Approved

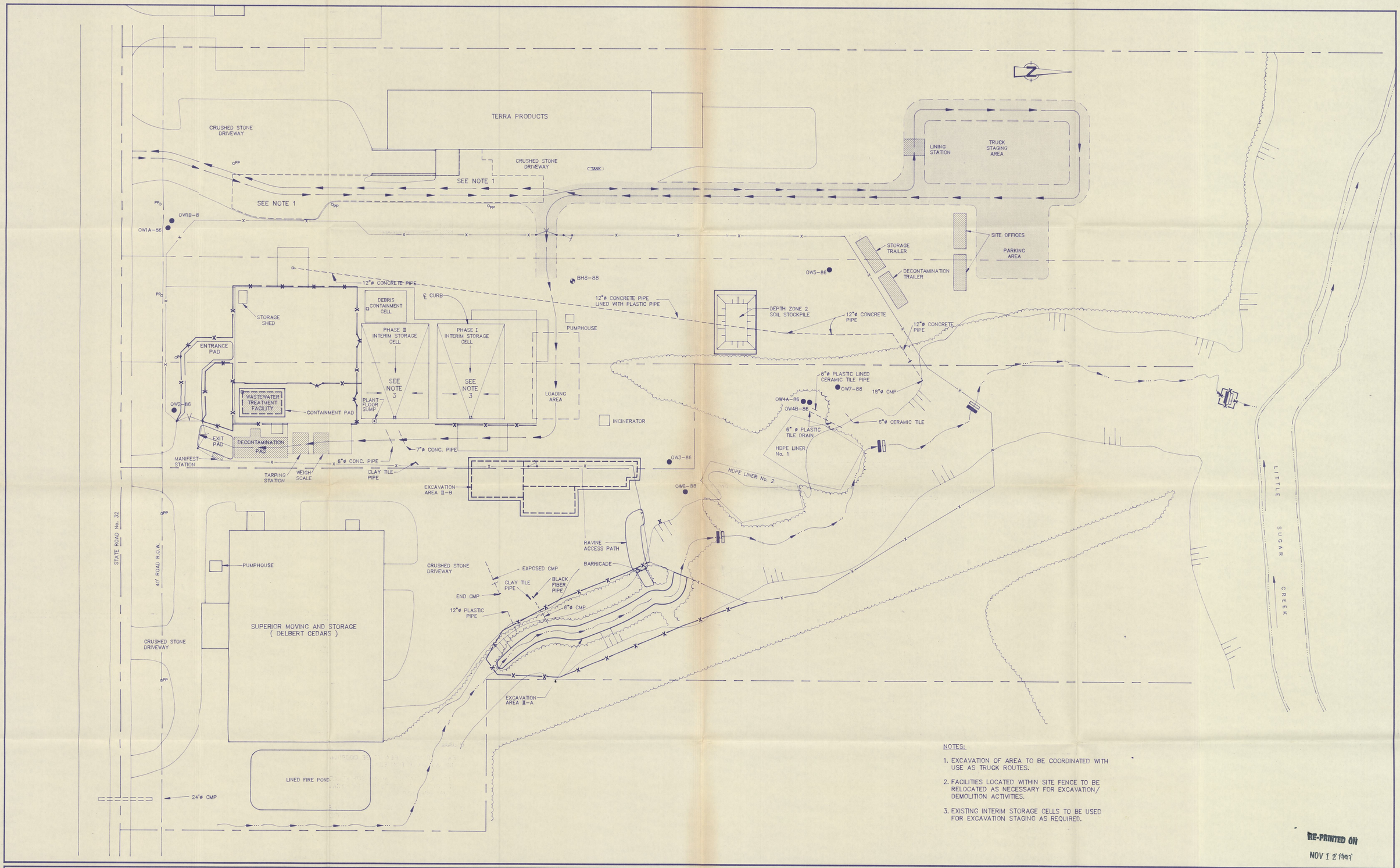
FORMER P.R. MALLORY PLANT SITE
CRAWFORDSVILLE, INDIANA.

SITE OPERATIONS PLAN – PHASE III REMOVAL ACTION

EXISTING SITE CONDITIONS

CRA
CONESTOGA-ROVERS & ASSOCIATES

Drawn by: R.B.B.	Scale: 1" = 40'	Date: SEPTEMBER 13, 1988	File No: S	Rev.No: -	
Designed by: J.C.	Field book:	Project No: 1916	Drawing No: 61 (P-28) PLAN 1		
Checked by: R.T.P.					



NOTES:

1. EXCAVATION OF AREA TO BE COORDINATED WITH USE AS TRUCK ROUTES.
2. FACILITIES LOCATED WITHIN SITE FENCE TO BE RELOCATED AS NECESSARY FOR EXCAVATION/ DEMOLITION ACTIVITIES.
3. EXISTING INTERIM STORAGE CELLS TO BE USED FOR EXCAVATION STAGING AS REQUIRED.

RE-PRINTED ON NOV 12 1987

LEGEND

- TREE LINE
- TOP OF SLOPE
- STREAM FLOW
- CREEK BANK
- OW5-86 OBSERVATION WELL
- BH8-88 BOREHOLE
- PROPERTY LINE
- SECURITY FENCE
- ACCESS GATE
- OPP POWER POLE

LEGEND

- TRUCK ROUTE
- TEMPORARY FENCING OR FLAGGED LINE
- OIL ABSORBENT BOOM
- SEDIMENT TRAP
- IMPROVED WORKING AREAS
- CONSTRUCTION SUPPORT FACILITIES

№	Revision	Date	Initial

Approved

FORMER P.R. MALLORY PLANT SITE
CRAWFORDSVILLE, INDIANA.

SITE OPERATIONS PLAN – PHASE III REMOVAL ACTION

SITE OPERATIONS PLAN

CRA
CONESTOGA-ROVERS & ASSOCIATES

Drawn by: R.B.B.	Scale: 1" = 40'	Date: SEPTEMBER 13, 1988	File №: S	Rev.№: –
Designed by: J.C.				
Checked by: R.T.P.	Field book:	Project №: 1916	Drawing №: 62 (P-31) PLAN 2	

TERRA PRODUCTS

CRUSHED STONE DRIVEWAY

LOADING DOCK (BELOW GRADE)

CRUSHED STONE DRIVEWAY

TANK

A1 1.0 | A2 H | A3 1.5 | A4 1.0 | A5 H | A6 1.5 | A7 H

B1 2.0 | B2 1.0 | B3 2.9

D1 H | D2 1.0 | D3 H | D4 1.5 | D5 2.0 | D6 7.0 | D7 1.5 | D8 1.5 | D9 6.0 | D10 1.0 | D11 7.5 | D12 4.5 | D13 2.0 | D14 3.0 | D15 1.0 | D16 3.0 | D17 1.0 | D18 1.5 | D19 1.0 | D20 1.5 | D21 1.0 | D22 H | D23 1.0 | D24 H | D25 H | D26 1.0 | D27 1.5 | D28 H | D29 2.0 | D30 H | D31 1.0 | D32 H | D33 H | D34 2.0 | D35 1.0

C1 1.0 | C2 H | C3 H | C4 H

E1 1.0 | E2 H | E3 1.0 | E4 1.0 | E5 2.5 | E6 1.0 | E7 1.5 | E8 1.0 | E9 1.0 | E10 H | E11 1.0 | E12 1.0 | E13 1.0

NOTE 1

NOTE 2

NOTE 3

NOTE 4

OW1A–86 | OW1B–86 | OW2–86 | OW3–86 | OW4A–86 | OW4B–86 | OW5–86 | OW6–88 | OW7–88 | OW8–88

STORAGE SHED

CLEAN ZONE

DEBRIS CONTAINMENT CELL

INTERIM STORAGE CELL No. 2

INTERIM STORAGE CELL No. 1

PUMPHOUSE

SOIL STOCKPILE

ENTRANCE PAD

CONTAINMENT PAD

EXIT PAD

DECONTAMINATION PAD

PLANT FLOOR SUMP

INCINERATOR

HDPE LINER No. 1

HDPE LINER No. 2

PLUGGED 6"ø PLASTIC TILE DRAIN

PLUGGED 18"ø CMP

PLUGGED 6"ø CERAMIC TILE

SCRAP & DEBRIS AREA

RAVINE ACCESS PATH

BARRICADE

EXPOSED CMP

PLUGGED 12"ø PLASTIC PIPE

CRUSHED STONE DRIVEWAY

PUMPHOUSE

SUPERIOR MOVING AND STORAGE

CRUSHED STONE DRIVEWAY

LINED FIRE POND

24"ø CMP

CMP

STATE ROAD No. 32

40' ROAD R.O.W.

LITTLE SUGAR CREEK

N

LEGEND

- OIL ABSORBENT BOOM
- SEDIMENT TRAP
- D13 / 2.0 — SUB–AREA IDENTIFIER / INITIAL EXCAVATION DEPTH LIMIT (ft)
- A2 / H — HOLD PENDING FURTHER SAMPLING AND ANALYSIS BY ENGINEER
- APPROXIMATE LIMIT OF PIPE EXCAVATION; EXACT LIMIT TO BE VERIFIED BY ENGINEER IN FIELD. SOIL TO BE REMOVED TO DEPTH OF 1.0 FT. BELOW INVERT OF PIPE.

NOTES:

1. REMOVE LINER AND GRANULAR FILL COVER FROM PREVIOUSLY EXCAVATED AREA. EXCAVATE 1.0 FT. OF SOIL BELOW BOTTOM OF LINER.
2. ENGINEER MAY DIRECT ADDITIONAL EXCAVATION OF SOIL UNDERLYING DEMOLISHED PLANT SLAB PENDING SAMPLING AND ANALYSIS.
3. ENGINEER MAY DIRECT EXCAVATION AND REMOVAL OF BURIED PIPES.
4. AREAS SHOWN AS BEING ON "HOLD" TO BE EXCAVATED PENDING FURTHER SAMPLING AND ANALYSIS BY ENGINEER.

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LEGEND

- TREE LINE
- TOP OF SLOPE
- STREAM FLOW
- CREEK BANK
- OW5–86 — OBSERVATION WELL
- oPP — POWER POLE
- PROPERTY LINE
- –x–x– SECURITY FENCE
- ACCESS GATE
- oLP — LAMP POST

No	Revision	Date	Initial

Approved

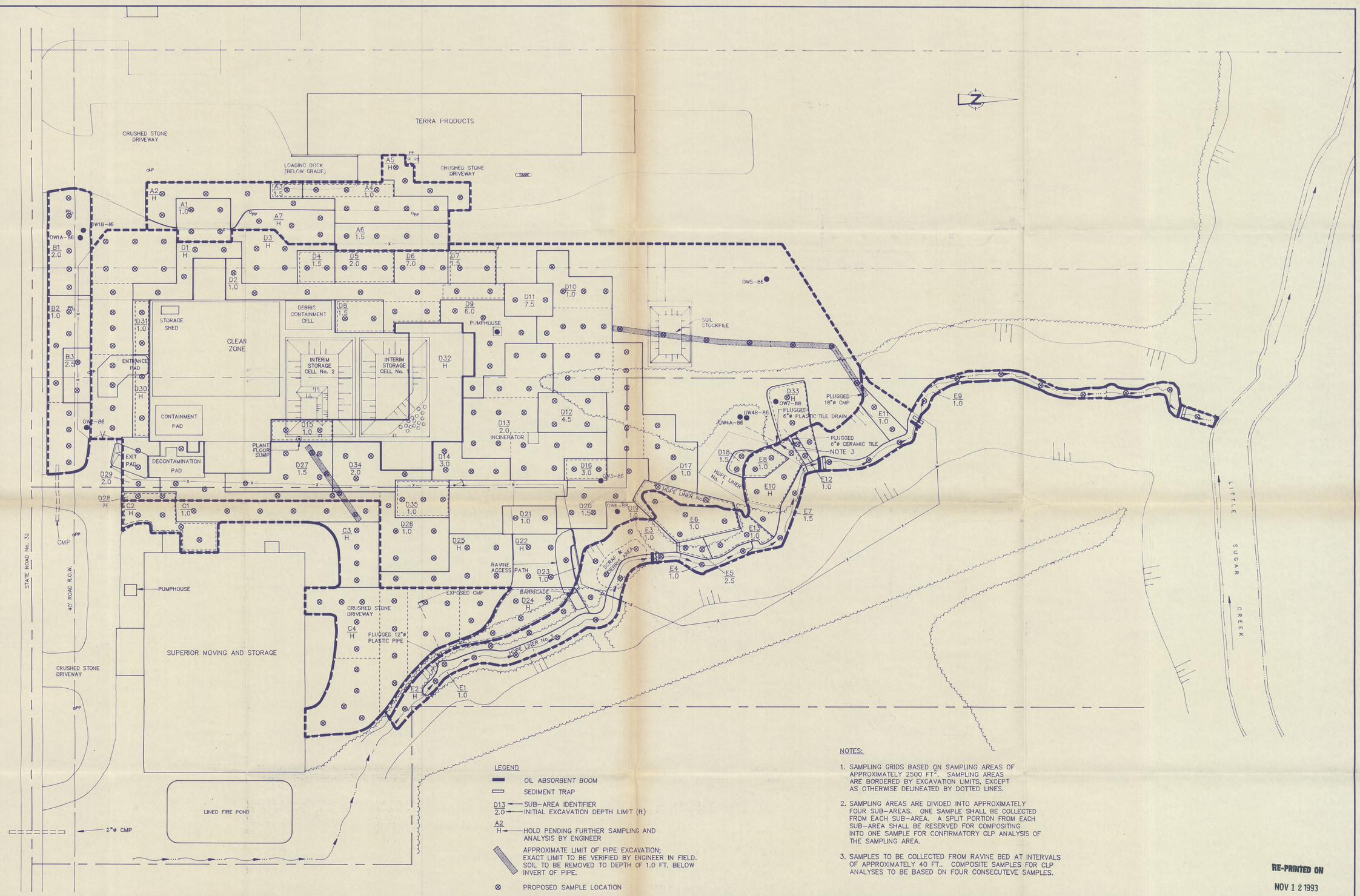
FORMER P.R. MALLORY PLANT SITE
CRAWFORDSVILLE, INDIANA.

SITE OPERATIONS PLAN – PHASE III REMOVAL ACTION

INITIAL EXCAVATION DEPTHS

CRA
CONESTOGA-ROVERS & ASSOCIATES

Drawn by: B.T.S.	Scale: 1" = 40'	Date: SEPTEMBER 13, 1988	File No: S	Rev. No: –
Designed by: J.C.				
Checked by: R.T.P.	Field book:	Project No: 1916	Drawing No: 63 (P-29) PLAN 3	



LEGEND

- OIL ABSORBENT BOOM
- SEDIMENT TRAP
- D13 / 2.0 — SUB-AREA IDENTIFIER / INITIAL EXCAVATION DEPTH LIMIT (ft)
- A2 / H — HOLD PENDING FURTHER SAMPLING AND ANALYSIS BY ENGINEER
- APPROXIMATE LIMIT OF PIPE EXCAVATION; EXACT LIMIT TO BE VERIFIED BY ENGINEER IN FIELD. SOIL TO BE REMOVED TO DEPTH OF 1.0 FT. BELOW INVERT OF PIPE.
- PROPOSED SAMPLE LOCATION

NOTES:

1. SAMPLING GRIDS BASED ON SAMPLING AREAS OF APPROXIMATELY 2500 FT². SAMPLING AREAS ARE BORDERED BY EXCAVATION LIMITS, EXCEPT AS OTHERWISE DELINEATED BY DOTTED LINES.
2. SAMPLING AREAS ARE DIVIDED INTO APPROXIMATELY FOUR SUB-AREAS. ONE SAMPLE SHALL BE COLLECTED FROM EACH SUB-AREA. A SPLIT PORTION FROM EACH SUB-AREA SHALL BE RESERVED FOR COMPOSITING INTO ONE SAMPLE FOR CONFIRMATORY CLP ANALYSIS OF THE SAMPLING AREA.
3. SAMPLES TO BE COLLECTED FROM RAVINE BED AT INTERVALS OF APPROXIMATELY 40 FT.. COMPOSITE SAMPLES FOR CLP ANALYSES TO BE BASED ON FOUR CONSECUTEVE SAMPLES.

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LEGEND

- TREE LINE
- TOP OF SLOPE
- STREAM FLOW
- CREEK BANK
- OW5-86 — OBSERVATION WELL
- ϕPP — POWER POLE
- PROPERTY LINE
- SECURITY FENCE
- ACCESS GATE
- ϕLP — LAMP POST

Nº	Revision	Date	Initial

Approved

FORMER P.R. MALLORY PLANT SITE
CRAWFORDSVILLE, INDIANA.

SITE OPERATIONS PLAN – PHASE III REMOVAL ACTION

SAMPLE LOCATIONS

CRA
CONESTOGA-ROVERS & ASSOCIATES

Drawn by: B.T.S.	Scale: 1" = 40'	Date: SEPTEMBER 13, 1988	File Nº: S	Rev.Nº: –
Designed by: J.C.				
Checked by: R.T.P.	Field book:	Project Nº: 1916	Drawing Nº: 64 (P-30) PLAN 4	